Ivanechko N.
Ph. D. in Economics, Associate Professor of Department of Marketing,
Ternopil National Economic University, Ukraine;
e-mail: n.ivanechko@gmail.com;

Borysova T.
Doctor of Economics, Associate Professor,
Head of the Department of Marketing,
Ternopil National Economic University, Ukraine;
e-mail: borisova.tanushka@gmail.com;

Monastyryskyi G.
Doctor of Economics, Professor,
Professor of the Department of Management, Public Administration and Personal,
Ternopil National Economic University, Ukraine;
e-mail: grymon@ukr.net

RESEARCH OF CUSTOMER BUYING BEHAVIOR ON THE UKRAINIAN ELECTROMOBILE MARKET

Abstract. Such key innovations as renewable energy and electric transport are being broadly deployed in the world nowadays. Interest of the consumer market in electric vehicles has increased for the last 5 years. The article analyzes the market for electric vehicles from the point of view of marketing, since the analysis of sources that consider marketing of innovations shows that insufficient attention is paid to the issues of marketing activity and marketing tools in the market of electric vehicles. The purpose of the article is to explore the Ukrainian market for electric vehicles, identify the use of marketing tools and offer new ones which could be effective and relevant for the modern consumer market of Ukraine. Two types of marketing information, namely, primary and secondary data, have become the basis for the study. When collecting primary data, the main criterion for the selection of respondents was their age according to Generation Theory. Generation was identified as a population of people born in the span of 20 years. Thus, Generation X (over 40), Generation Y (20 to 40), Generation Z (up to 20) were covered in equal parts, accounting for 33.3% of the sample. The survey was conducted using the method of questioning with open and closed questions on the basis of confidentiality. Secondary data are based on empirical studies of market experts, professional community sites, and official statistics. Based on the results of the study, the authors have concluded that at present car companies that produce and sell electric transport do not conduct active marketing activities in the Ukrainian market and do not pay attention to marketing tools. As a consequence, many potential buyers are unaware of the benefits and capabilities of an electric vehicle and do not intend to purchase one. It is suggested to use differentiated marketing tools, based on the model of consumer behavior of generations. Along with the scientific value, the results of this study can be used by marketers of automobile companies to develop a profile of a potential buyer of an electric vehicle in Ukraine and formulate marketing plans aimed at definition and selection of marketing mix.

Keywords: marketing, consumer behavior, Generation Theory, urban transport, ecologistics.

Formulas: 0; fig.: 0; tabl.: 1; bibl.: 11.
ДОСЛІДЖЕННЯ КУПІВЕЛЬНОЇ ПОВЕДІНИКИ СПОЖИВАЧІВ НА РИНКУ ЕЛЕКТРОМОБІЛІВ УКРАЇНИ

Анотація. Обґрунтовано необхідність диференціювати маркетингові інструменти стимулювання попиту на електромобілі в розрізі поколінь. Актуальність статті обумовлена активним упровадженням ключових інноваційних технологій, серед яких — відновлювані джерела енергії та електротранспорт; разом з тим, установлює, що в Україні за останні п’ять років зросла зацікавленість споживчого ринку до електромобілів. Проаналізовано ринок електромобілів щодо маркетингу. Систематизація літературних джерел і підходів до розв’язання проблеми якості транспортних послуг засвідчила, що питання взаємозв’язку попиту на електромобілі та належність до покоління досі не досліджувалося. Метою статті є дослідити український ринок електромобілів, виявити напрями використання маркетингового інструментарію і запропонувати маркетингові інструменти, дієві та актуальні для сучасного споживчого ринку України. Методичним інструментарієм проведенного дослідження стали опитування методом інтер’ю, опитування через запити на доступ до публічної інформації відповідно до Закону України «Про доступ до публічної інформації», які були надіслані до всіх міських рад регіонів України, за винятком тимчасово окупованих територій. Дослідження включало опитування 600 респондентів різних вікових груп за допомогою анкет. Під час збору первинних даних головним критерієм відбору респондентів був їхній вік згідно з «теорією поколінь». Покоління ідентифікувалося як сукупність людей, народжених у проміжку часу, що становить 20 років. Таким чином, було охоплено покоління Х (старші за 40 р.), покоління Y (від 20 до 40 р.), покоління Z (до 20 р.) у рівних часинах, що становить 33,3 % вибірки. Опитування проводилося за допомогою методу анкетування з відкритими і закритими запитаннями на засадах конфіденційності. Вторинні дані отримано на основі емпіричних досліджень експертів ринку, даних сайтів професійних спільнот, офіційної статистичної інформації. На основі отриманих результатів дослідження дійшли висновки, що на даний момент автомобільні компанії, які випускають електротранспорт, не проводять активну маркетингову діяльність на ринку України. Запропоновано використовувати маркетингові інструменти диференційовано залежно від моделі споживчої поведінки поколінь.

Ключові слова: маркетинг, поведінка споживачів, Теорія поколінь, громадський транспорт, екологістика.

Формул: 0; рис.: 0; табл.: 1; бібл.: 11.

Introduction. The Fourth Industrial Revolution has led to a new understanding and attitude of the society to the exploitation of natural resources by humans and technological changes of the future. In recent years, a number of studies have been conducted to make a qualitative breakthrough in the organization of human activity. These include nano sensors and the Internet of nanoscales, new methods of energy storage and its generation, autonomous cars, blockchain technologies, two-dimensional materials, smart grids, systemic metabolic engineering, hydrogen energy, direct air capture and its purification. The development of the fourth industrial revolution is a challenge for national economies, and countries that are able to quickly embrace and introduce innovative technologies will gain significant advantages in the global market. Nowadays, some countries have already been actively implementing key innovative technologies for energy efficient production and are investing in the development of renewable energy and power. Due to the difficult socio-economic situation, Ukraine is still lacking behind these processes, but the consumer market of the country shows interest in innovative technologies, in particular, modern electric transport. The
study is topical for cities and regions of Ukraine located in a dynamic environment. This approach is vital for their modernization and new environmentally friendly and efficient approaches to governance. Thus, knowledge of management and marketing is being successfully used in the creation and development of urban governance models to achieve competitive advantage in an increasingly globalized world where there is a struggle for investors, tourists and residents. The study is crucial for the analysis of the vectors of development of the transport system of the Ukrainian cities on the basis of innovation, environmental friendliness taking into account residents’ view points as services users. Special attention needs to be paid to the development of urban transport as an important component of the city’s infrastructure. The results of numerous studies showed that development of urban transport on the basis of intellectual technologies should be the focus of attention. Such issues have been partially addressed in a number of Council of Europe Commission projects in support of energy efficient transport, namely « A Direct Marketing Program for Public Transport (A D PERSONAM ) » during 2008—2010, « Electric City Transport » (ELE.CTRA), which lasted from 2013 to 2015, « Addressing Key Challenges of Sustainable Urban Mobility Planning (CHALLENGE) » (2013—2016).

Research analysis and problem statement. The problem of marketing mix in management of electric transport has been investigated by domestic and foreign scientists. Spivakovska and Spivakovsky undertaken directions of using marketing tools in the Ukrainian automobile market [1], Honchar and Palyan [2] conducted statistical analysis of the electric car market development in Ukraine, discussed its problems and solutions. Gelmanova, Zhabalova, Sivyakova, Lelikova, Onishchenko, Smailova, Kamarova [3] considered the positive and negative aspects of the use of electric vehicles, made a rough calculation of the energy efficiency and average cost per month, set priorities to avoid the existing problems in the market of electric vehicles. Fontainhas, Cunha, Ferreira [4] undertaken comparisons between internal combustion engine cars and battery EV (BEV), evaluating the excess cost for the consumer, complemented the evaluation by a probabilistic risk analysis, devoted that the car market segment is a relevant aspect with the results suggesting that the acquisition of BEV for the higher end car market segment can easily become a financially attractive option. Dembiński [5] made the outlook for the development of the electric car market in Poland. Farhan [6] described ways of marketing of electric cars. Israel [7] described a research to modernize the pollution free rickshaw-van, aiming to improve the lifestyle and income of the rickshaw-pullers and reduce stress on the health of the pullers. Ortar, Ryghaug [8] discussed the viewpoints and arguments in order to bring new insights to European policymakers that are seeking to promote the market for electric vehicles. Enyedi [9] described challenges and trends of electric cars market.

The purpose of the study is to identify the differentiation in customer buying behavior of electric car buyers according to generation theories. In addition, innovative marketing mix for the development of the electric car market has been proposed. The article objective is.

Methodology and research methods. Two types of marketing information, namely, primary and secondary data, have become the basis for the study. When collecting primary data, the main criterion for the selection of respondents was their age according to Generation Theory. Generation was identified as a population of people born in the span of 20 years. Thus, Generation X (over 40), Generation Y (20 to 40), Generation Z (up to 20) were covered in equal parts, accounting for 33.3% of the sample. The survey was conducted using the method of questioning with open and closed questions on the basis of confidentiality. 600 respondents were interviewed. Secondary data are based on empirical studies of market experts, professional community sites, and official statistics. Also the authors provided a study on the current state of urban public transport in regional Ukrainian cities. Following this, the requests for public information were submitted in accordance with the Law of Ukraine «On Access to Public Information» to all city councils of Ukraine’s regions except temporarily occupied territories.

Research results. In 2018, around 2 million electric vehicles were purchased worldwide, out of total of 5.6 million electric vehicles being used globally. Despite the rapid growth in the purchase of electric vehicles in Ukraine over the last five years, our country is significantly behind
in the consumer market. Comparing five-year-old data, we can notice the quantitative 100 times growth of the purchase of electric vehicles. This proves positive tendency with the view of preserving the environment, especially the cities’ cleanliness.

In January — March 2018, the authors conducted a survey by means of a post-poll survey aimed at identifying the degree of marketing orientation of the urban public transport service providers of the regional Ukrainian cities. Among the objectives of the study was to find out how much the quantitative and qualitative composition of the fleet and the fleet of electric vehicles satisfy customers’ needs, or information support is sufficient, the amount of funding from local governments and the state, the existence of strategies for the urban public transport, participation in international transport development programs, environmentally friendly level of vehicles and others. In accordance with this, the requests for public information were outlined and submitted following the Law of Ukraine «On Access to Public Information» dated from January 13, 2011 № 2939-VI, to all city councils of Ukraine, except temporarily occupied territories. The analysis of the responses received from the city councils representing all regions of Ukraine (Letters, 2018) (except for the temporarily occupied territories of Ukraine) made it possible to draw conclusions, some of which are shown below. The study revealed that the majority of services responsible for urban transport infrastructure development do not keep track of car exhaust fumes and other pollutants emissions. According to the order of the State Statistics Service of Ukraine № 60 of 19.02.2015, it is not obligatory to calculate pollution produced by car exhaust fumes. At the same time, our study found that urban public transport in most Ukrainian cities is equipped with non-environmentally friendly engines. Only 13% of the respondents put forward requirement EURO-5 for competition participants, EURO-4 and EURO-3 — 4% of the respondents, EURO-2 — 22% of polled, other respondents did not indicate whether there was such a requirement for potential carriers [10].

This situation actualizes the need for the use of ecologically clean electrical vehicles in Ukraine. It is worth noting that the Ukrainian Association of Electric Vehicle Market Participants has already recorded an increase in demand for commercial use. According to the site of manufacturers and dealers InsideEVs the most popular models of electric vehicles in the world are Tesla Model 3 (USA), Nissan Leaf (Japan), BAIS ES-Series (China). Such makes as Tesla Model S, BMW 13, Mercedes-Benz, Renault Zoe, and Nissan Leaf were the most popular in Ukraine in 2017—2018.

### Table 1

<table>
<thead>
<tr>
<th>Electric car make</th>
<th>Country Manufacturer</th>
<th>New car average price, US$</th>
<th>3-year-old electric car average price, US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nissan Leaf</td>
<td>Japan</td>
<td>25 900</td>
<td>13 000</td>
</tr>
<tr>
<td>Tesla Model S</td>
<td>USA</td>
<td>79 000</td>
<td>45 000</td>
</tr>
<tr>
<td>BMW i3</td>
<td>Germany</td>
<td>38 200</td>
<td>23 000</td>
</tr>
<tr>
<td>Renault Zoe</td>
<td>France</td>
<td>32 000</td>
<td>14 500</td>
</tr>
<tr>
<td>Mercedes-Benz</td>
<td>Germany</td>
<td>37 620</td>
<td>21 000</td>
</tr>
<tr>
<td>B-class Electric Drive</td>
<td>Germany</td>
<td>37 620</td>
<td>21 000</td>
</tr>
<tr>
<td>Mitsubishi i-MiEV</td>
<td>Japan</td>
<td>45 000</td>
<td>-</td>
</tr>
<tr>
<td>Hyundai IONIQ electric</td>
<td>South Korea</td>
<td>31 000</td>
<td>21 000</td>
</tr>
</tbody>
</table>

Source: calculated by the authors on the basis of data [11].

The dynamics of electric cars’ purchase show that Ukrainians prefer Nissan Leaf. At the same time, only BMW, Mitsubishi, Hyundai, Renault and Tesla are officially sold electric cars in Ukraine, which in 2018 enabled Ukrainians to order online. According to car market experts, 70—80% of electric cars are purchased by Ukrainians had been used in Europe before or imported from the US. Car companies are underestimating the Ukrainian market for electric vehicles, although in 2018 Ukraine was one of the leaders in Europe in terms of purchased electric automobiles. Figure 1 and Table 1 show that the cost of an electric car affects the choice of buyers in Ukraine, so Nissan Leaf is the leader among popular makes and the best in value for money.
runner-up is the electric car Renault Zoe, which ten times increased its purchasing power in 2018 comparing with 2017.

It should be noted that among the electric vehicles presented in Table 1, only Tesla Model S is a product of the innovative Tesla Motors company, all others are a consequence of the improvement of the product policy of the car companies. Tesla Motors, an American startup, uses innovative solutions in its marketing activities, such as selling electric vehicles through a website over the Internet, and is therefore a favorite brand for Generation Y, which, according to the consumer behavior model, is an innovator. We conducted a survey using an open-ended and closed-ended questionnaire survey, during which consumers were segmented according to «generation theory». Generations were identified as a set of people born in the span of 20 years, thus, it covered generation X (over 40), generation Y (from 20 to 40), generation Z (up to 20). Since each generation has its own values and consumer behavior model, marketing mix should be correspondingly. Generation X is considered to be conservative whereas Generation Z is more pragmatic.

The Generation Z poll was attended by 50% of young girls and 50% of young men, all with a monthly income of up to 300 euros, 65% of which can drive a car. During the survey it was found that 20% of the respondents among generation Z know neither the advantages nor the disadvantages of electric vehicles, 30% among the disadvantages indicated the high cost of electric vehicles, 35% low battery life and 30% undeveloped infrastructure. Among electric cars benefits, 37.5% of the respondents indicated cost-effectiveness, 69% — environmental friendliness. Only 20% would prefer to purchase an electric car, 80% would prefer a car which runs on petrol. The advantages of the car are speed (45% of the respondents) and sufficient number of stations (30% of the respondents).

Generation Y survey was attended by 55% of men, 45% of women, 45% of them with monthly income up to 300 euros, 40% from 300 euros to 1000 euros, 15% more than 1000 euros. 90% of those polled can drive, they preferred electric cars and cars (45% each), 10% were not sure which one to prefer. 55% of the respondents attributed low battery life as one of the disadvantages of electric cars, 50% — undeveloped infrastructure, namely insufficient number of stations and service centers, which limits long-distance travel. Only 5% of the respondents cited the high cost of electric vehicles as a drawback. Also, among the Generation Y respondents, 15% of them were unaware of the disadvantages and 15% did not know anything about the benefits of an electric vehicle. The advantages of electric cars of Generation Y, as well as generation Z, are economy and environmental friendliness (50% and 60% of the respondents from each age group respectively). Additionally, they would prefer to purchase either a car or an electric car (45% of the respondents), 10% did manage to voice their preferences.

56% of men participated in Generation X survey, 44% of women, 35% of them with monthly income up to 300 euros, 50% from 300 euros to 1000 euros, and 5% more than 1000 euros. 67% of the respondents can drive. 35% would prefer to buy a car, and 50% an electric car. Again, it was difficult to name any preferences for 15% of the respondents. Among the disadvantages of electric vehicles, the respondents indicated high cost (35%), low battery life (25%), insufficient number of stations and service centers (55%). 40% of the respondents consider efficiency of electric cars as their advantage, 45% mention their eco-friendliness and 30% were unaware of any benefits. However, all respondents of the X, Y, Z generations noted cars’ advantages such as the developed network of stations and service centers, as well as the speed of the refueling process and the ability to drive long distances without refueling. Thus, the study showed that the respondents of all ages attributed efficiency and environmental friendliness to the benefits of electric vehicles. This indicates a low awareness of potential buyers, since the advantages of electric vehicles also include ease of driving, convenient and cheap maintenance, and noiselessness. It is worth mentioning that some respondents indicated only one preference while others two.

The high cost, low battery life and underdeveloped infrastructure in Ukraine were among the disadvantages of electric vehicles. It should be noted that under «undeveloped infrastructure» the respondents meant the low number of electric vehicles’ refueling stations, the insufficient number
of garages and specialists. The respondents used the term «low battery life» to refer to frequent refueling and speed restrictions. The chart shows that Generation Y does not consider the cost of an electric car high and intends to pay for innovation. Generation Z would prefer to buy a combustion engine car. Obviously, this decision can be explained by a low awareness of the advantages of electric vehicles and their technical parameters. Generation Z would prefer to buy a combustion engine car. Obviously, this decision can be explained by a low awareness of the advantages of electric vehicles and their technical parameters.

10% among the generation Y did not make their final decisions, 45% would prefer any car type, but believe that the combustion engine car is faster and more comfortable. The highest rate of those who would prefer to buy an electric car, namely 50%, was among Generation X but still there were 15% who remained undecided. Only 35% of the respondents would prefer a combustion engine car, as they mentioned its poor environmental impact and the rising cost of fuel.

Conclusions. According to the study, the Ukrainian consumers were not well aware of the benefits of electric vehicles and were insufficiently informed about the technical characteristics and possibilities of their use in the areas where combustion engine cars are traditionally used. Also, the use of marketing mix to bring innovative products to the market requires a proper definition of the pattern of consumer behavior of potential customers. It is established that for pragmatic generation Z, among the marketing mix, more attention should be paid to the combination of rational economic factors and product characteristics. To meet their needs, emphasis should be placed on the functional characteristics of the electric vehicle, namely the simplicity of the car design, cheap operation, and ease of management. With modern promotion methods, such as SMM, it is worth informing about the benefits of an electric car compared to a combustion engine car. The pricing policy should develop credit opportunities to young people to purchase an electric car. Since Generation Y does not want to spend time on a long electric vehicle refueling and is loyal to the high cost of an electric vehicle, it is advisable to offer advanced fast rechargeable batteries with the help of marketing mix. Furthermore, promotion activities should be focused on creating information waves on the development of a network of fast charging stations for electric vehicles and the opening of full-fledged services for electric transport. Generation Y is the most actively involved in business. Those who belong to this generation are innovators, so sales through new channels will satisfy their needs for development of their skills and abilities. It is important to formulate a pricing policy for Generation X, to develop discounts or preferential terms of payment. Considering that this is a generation of conservatives, with traditional marketing mix, it is worth informing about cost-effective maintenance, free oil, air and fuel filters replacement. It should be borne in mind that this generation has an idea of environmental conservation, so all marketing 4Ps should be used through the lens of ecology and environmental concern.

The novelty of the article lies in the establishing the relationship between a customer’s belonging to a particular generation and his or her consumer motivations for electric vehicles and proposing innovative marketing mix for the development of the electric car market. Socio-economic effect resulting from the introduction of scientific results: change in the volume of financial resources, the number of customers, increases the level of satisfaction of the needs of target groups due to better adaptation of the proposal to the needs of customers, helps to rationalize the use of marketing tools of the organization. The use of marketing mix to satisfy the needs of consumers in the electric vehicle market will create a synergistic effect by increasing the profitability of car companies and solving a number of environmental problems. The authors further attributed the further development of research of development of marketing communication activity of urban public transport providers’ services.

Література
1. C. 19—27. URL: https://www.eurekalert.org/pub_releases/2017-01/sci-110317.php

The article is recommended for printing 02.12.2020. © Ivanechko N., Borysova T., Monastyrskyi G.