

## **METHODOLOGICAL FRAMEWORKS OF MARKETING RESEARCH IN THE BIOENERGY MARKET**

Julia Galchynska

National University of Life and Environmental Sciences of Ukraine, Ukraine

### **INTRODUCTION**

Over the last few years, the importance of marketing activity to agrarian and recycling enterprises in Ukraine has increased. By implementing marketing methods and a wide range of marketing instruments, manufacturers can actively produce and sell their goods. The methods and instruments include calculating the volume of necessary production and material resources, selecting effective sales channels and locations, planning an effective product range, offering competitive prices, forecasting the demand for future production and controlling demand through effective marketing planning etc.

### **ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS**

There are different ways of interpreting the term marketing research. These ways are conceptually alike but have their own specific features [Churchill 2000, Belyavtsev 2014]. Bioenergy market research is the systematic and formalised study of the objective market information required to make management decisions in marketing and bioenergetics. The research includes collecting information, processing, analyzing, and reporting on the results, drawing conclusions and recommendations. The final goal of the research is to provide a systematic and detailed study of all marketing aspects related to products and services offered by enterprises in the bioenergy sector. The role of complex marketing research of the bioenergy market is to examine and evaluate market information, conditions, structure, demand dynamics and customer preferences. It also includes an evaluation of the enterprise itself, aimed at developing an effective marketing programme. While performing such research, it is important to avoid false estimations, risks and unfeasible investments, which might lead to marketing decision-making, which is time-consuming.

TABLE 1. Main concepts and categories of bioenergetics marketing research

Concepts and categories	Description
Goal	Create company information-analytical database so it can take a competitive position in the bioenergy market at a certain time by adapting its products to the needs and requirements of customers, reducing uncertainty, risks and increasing the probability of successful market
Object	Any unit of the “enterprise-market-economy” system or any particular feature of a unit. Research activity of researchers (subject) directed at the object (a bioenergy product, raw material suppliers, consumers of bioresources etc.)
Subject	Existing marketing problem regarding the circumstances of the bioenergy market marketing environment, available resources, success or failure criteria, time limits, risk
Targets	<ul style="list-style-type: none"> <li>– Search – collect preliminary data that “shed light on the problem”, and possibly help develop an hypothesis. This decreases uncertainty in the marketing decisions made</li> <li>– Description – describe certain phenomena, such as finding out the number of people who use a company’s services</li> <li>– Experiment – test the hypothesis of a causal relationship</li> </ul>
Tasks	<ul style="list-style-type: none"> <li>– Analyze the situation on the bioenergy market</li> <li>– Identify positive and negative trends in the dynamics of biomass production, forecast, consider the feasibility of using products both in consumption and production of biofuels</li> <li>– Research the behaviour of bioenergy market players</li> <li>– Assess activity results and determine the competitive position of the bioenergy enterprise</li> <li>– Focus on producing goods in demand due to certain market conditions, improve product policy</li> <li>– Develop and update marketing mix according to research results</li> <li>– Research sales forecast</li> <li>– Develop a detailed marketing programme for the enterprise</li> </ul>
Functions	<ul style="list-style-type: none"> <li>– Educational – help in understanding the processes and phenomena that occur in bioenergy (data collection, processing, analysis, forecast)</li> <li>– Diagnostic – help in decision-making (identify tools that can influence demand and determine the optimal level of influence)</li> <li>– Predictive – help in predicting future formation processes and phenomena in the tourism market. This is particularly important when forecasting sales of a travel company and its closest competitors. New product sales forecast is especially important here</li> <li>– Controlling – help in verifying the results</li> </ul>
Principles	<ul style="list-style-type: none"> <li>– Consistency (rationale, periodicity), reflecting the specific feature of a systematic approach, which is a form of methodological knowledge related to the research and creation of objects as systems</li> <li>– Scientific approach – apply research methodology based on objective laws, scientific positions, methods and models, and software</li> <li>– Complex approach – consider and analyze all relevant elements and factors in their dynamics and interaction</li> <li>– Purposefulness – focus on current marketing problems</li> <li>– Objectivity – independence from subjective assessments and conclusions</li> <li>– Reliability – impartiality, accuracy in data acquisition</li> <li>– Consistency (consistent thinking), ensured by compliance with the laws of Aristotelian logic and, foremost, the law on preventing contradictions</li> <li>– Profitability – the benefits of improving the enterprise’s operation thanks to the implementation of decisions taken should exceed the costs of conducting market research</li> <li>– Compliance with the principles of fair competition</li> <li>– Verification – the greater the number of facts proving the truth of a hypothesis, the more plausible it will be considered</li> <li>– Consumer confidence</li> </ul>

Source: the author based on Chebotar et al. 2007.

The main precondition for bioenergy market research is the need to obtain such information which will minimise the risks of ineffective decision-making. The bioenergy market has no specific research tools of its own, but adapts general tools. Market study is the main component of the marketing research. Table 1 presents the main goals and principles of marketing research in the field of bioenergetics.

In regularly monitoring information on marketing opportunities and threats and market conditions, energy producers must respond to changes, coordinating all activities in line with a prearranged strategy and marketing tactics. However, the impact of market processes on production and economic activity is not unidirectional. By using marketing tools, producers can eventually modify the market situation [Semchuk 2015].

In studying the research methodology used in the bioenergy market, attention should be paid to the study of algorithms of the marketing research process. The stages are explained in Table 2. At the preparatory stage, a number of hypotheses are put forward to justify particular research options. On the basis of these hypotheses, marketing research algorithms are developed. The marketing problem is determined (e.g. a fall in market share, customer loyalty, or profitability, to name three) and specific tasks are established.

To generate working hypotheses, virtually all creative methods are applicable. They can be divided into two groups: logical (systematic and logical) and intuitive creative methods. In this case, the product (biofuels) is both a physical product as a result of production and a set of marketing elements. Thus, the product can be represented as a system consisting of a product, its technical specifications, quality, and the provision of complex and restrictive elements. A systematic approach to the concept of the product is predicated on the need to consider the unity and mutual influence of all of the elements of the marketing mix. The necessary quality of the product (biofuels) as its integral characteristics,

TABLE 2. Marketing research algorithm for companies operating in the bioenergy market

Phase of the research process	Process stages	Tasks
Concepts	Preparatory	1. Define the research problem 2. Determine the possibility for research into the existing problem; 3. Formulate hypotheses, goals and tasks 4. Elaborate the research plan (select type of research, variables, parameters, sources of information, development of activities and their characteristics, preparation of the budget for research, approval of research tools) 5. Select performers (at this stage it must be decided whether the research will be carried out by the company itself or with the assistance of specialised firms, including recruitment and HR instructions, gathering information using specific tools, documenting the information)
		6. Collect and process data (check information for accuracy, data entry into software) 7. Analyze the data
Implementation	Search (Data accumulation)	8. Interpret the results
	Analysis and summary (Processing of results)	9. Prepare the research report, formulate conclusions and results 10. Present and implement research results

Source: developed by the author based on Kovalenko 2008, Semchuk 2015.

reflecting the needs of the market and, conversely, and the extent to which it meets the requirements and needs of the market, is expressed in the research of mutual needs, i.e. in the course of the market research [Semchuk 2015].

One of the key elements of market research on biofuels is the study of the environment in which the manufacturer operates. The SWOT analysis and PEST analysis form the methodological basis of that study. These analyses can also help one achieve the primary goals of marketing research, formulate hypotheses, goals and tasks. However, before conducting SWOT and PEST analyses, it is useful to examine the macro (external) and micro environment in which the entity operates. Factors of indirect action in the macro environment can impact the entity's activities on the market both positively and negatively.

The company's environment can be examined using the following approach [Sayenko 2006]:

1. Determine the factors affecting the enterprise;
2. Attain maximum information on these factors;
3. Estimate the information on every factor of the environment's influence and predict the magnitude of the influence;
4. Determine threats and opportunities present in the macro environment and the strengths and weaknesses of the micro environment (SWOT analysis and PEST analysis);
5. Create a database for strategic analysis and researching further strategies.

The degree of each factor's influence is estimated and ranked by importance, while threats critical for the entity and the most profitable and vital opportunities are determined.

The search for information on environmental factors is conducted mainly through the following forms and methods:

- scanning the environment (secondary data collection including statistics, reviews, scientific papers etc.); at this stage the following methods are distinguished: observation, survey, Delphi method, experiments;
- monitoring including surveillance, survey (questionnaire), Delphi method, and experiments;
- predicting the impact of environmental factors; methods: extrapolation (prediction from the baseline), brainstorming (joint forecasting by a group of experts), mathematical programming methods, building scenarios.

Analyses of SWOT and PEST should be conducted after the detailed study of the micro and macro environments has been completed. First used in the 1960s, SWOT analysis involves seeking connections between two groups of factors: opportunities and threats facing the organisation (representing the external environment) and its strengths and weaknesses (the product). Analysis of SWOT can assist in analysing both the internal and external environment of the bioenergy market.

For such an analysis, it is also necessary to consider the enterprise's strength and the market situation, and set enterprise objectives while taking into account the existing opportunities. The SWOT analysis matrix is then filled, enabling strategists to determine the main directions of the bioenergy enterprise's development and formulate the basic problem areas requiring immediate solutions for successful marketing activities to occur.

Quantitative assessment of strengths and weaknesses provides a ranking of problematic issues, and the resources are allocated between them (hence the problem field of the enterprise is set out). Quantitative assessment of the problem is the aggregate of expert evaluations of combinations of strengths and weaknesses, which are matched with opportunities and threats. Typically, for a more in-depth study of the internal environment, SNW analysis (strength, neutral, weakness) is used to highlight the strengths, weaknesses and neutral points.

Analysis of SWOT correlates with PEST analysis, another important step in marketing research [Galchynska 2015]. Analysis of PEST is somewhat of SWOT analysis component when the factors of external environment influence are determined, and serves as a tool to determine the impact of basic external factors including political (P), economic (E), social (S) and technological (T). All of these factors are commonly estimated in a four-field table.

Once all the information has been collected and structured, it is estimated. Not all of the manifold factors of the changing macro environment affect or may affect the company. It is therefore important to determine which factors in the initial array of information represent opportunities or threats for the company, and include them in the final PEST analysis matrix.

There are also other options for PEST analysis [Rothaermel 2012]:

- PEST: political + economic + social + technological factors;
- PESTEL: PEST + natural, environmental, legal factors;
- PESTELI: PESTEL + industry market analysis;
- STEEP: PEST + ethical factors;
- LONGPEST: PEST + the assessment of local, national and global factors.

Analysis of PEST nonetheless remains the most common of the bunch. All of its indicators are inseparable and must be considered with regard to the impact they have on the activities of the enterprise as a whole. In practice, the most frequently analyzed factors are economic and political, as they are crucial in an enterprise's planning process. However, without analyzing the social sphere, it will not be possible to plan enterprise activities for 3–5 years as accurately as possible, especially during an economic crisis.

While primary data constrain information collected for the first time for marketing research (fieldwork), SWOT-, SNW- and PEST-analysis data can serve as secondary information. Secondary data include those gained from desk research and publicly available information that has already been collected. Secondary information about a company is divided into internal and external. For marketing research in the bioenergy market, it is possible to gather the following sources of internal information: company statistics and reports (accounting reports, characteristics of the marketing mix system and expenses for all its elements, lists of customers, sales volumes, reports of vendors, import, export, price lists, consumer complaints, executive reports from shareholder meetings).

External information (information obtained from various sources, but not the company itself) includes [Pavlenko and Voychak 2003]:

- information from the state statistics authorities and other state and public organisations;
- information collected by various scientific and educational institutions;
- data and information from mass media;

- advertising and commercial data on other companies;
- reference information: newsletters, registers, reference books, statistical compilations, certificates from official organisations, exporters, balance sheets, catalogs, other enterprises' brochures;
- field studies done by other business entities (surveys, observations, experiments);
- data from economic census and social census;
- data on patent registration, licenses and other exclusive rights of competitors;
- exhibitions and fairs, presentations, conferences; information from customers, consumers, clients; suppliers; sphere of trade; finance; informal sources;
- effective marketing research informational support subsystem – a combination of economic, legal and organisational relationships of sales and purchasing of information services developed between borrowers and consumers;
- arbitration chronicle materials;
- telecommunications (among foreign telecommunication networks there are the well-known Arpanet, Internet, Bitnet, EARN, NetNorth, EVnet).

Both international and domestic sources contain a large amount of external information about the bioenergy market. They include the State Statistics Service of Ukraine, electronic resources of the State Agency of Forest Resources of Ukraine, technical reports assessing the potential of renewable energy in Ukraine, the annual report of the European Biomass Association – AEBIOM, reports of the analytical group Bloomberg New Energy Finance, financial statements of business entities within the network of the Institute of Bioenergy Cultures and Sugar Beets of the NAAS of Ukraine, experience of the State Agency for Energy Efficiency and Energy Saving of Ukraine and the Ukrainian Association of Renewable Energy, analytical materials published by the Bioenergy Association of Ukraine, Association of Bioenergy Structures, reports of bioenergy companies, advisory services at district, regional state administrations etc.

The most common means of collecting market information employed by companies operating on the bioenergy market include commercial espionage, marketing intelligence, competitive intelligence, economic intelligence, and benchmarking. To collect data, Ukrainian companies widely use devices for computerised telephone surveys and for computerised personal interviews. Primary information can be collected quickly and cost-efficiently through the Internet.

## CONCLUSIONS

A complex solution to the issues involved in building a marketing system for bioenergy structures in terms of balancing the interests of producers, consumers of biofuels and the state is the basis for implementing market mechanisms in the bioenergy sector in Ukraine. A marketing system in the industry is an effective means of integrated communication between the market for the product and its manufacturer and production. At the same time, production and consumption of energy sources are also synchronised.

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**Summary.** The paper summarises and analyzes the methodological bases of marketing research of the bioenergy market. One of the key elements of such research is the study of the environment in which the biofuel manufacturer operates. The article examines SWOT and PEST analyses as marketing research methods and tools of Ukraine's bioenergy market. The process of implementing marketing research in the biofuels market is investigated, and the impact of macro factors on the results of current and future activities of the industry is considered and evaluated.

**Key words:** marketing research, methods, SWOT analysis, PEST analysis, bioenergy

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**Corresponding author:** Julia Galchynska, National University of Life and Environmental Sciences of Ukraine, Ukraine, e-mail: [galchynskaya@gmail.com](mailto:galchynskaya@gmail.com)