

INNOVATION UTILITY FORMATION

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The article deals with the concept of innovation consumer utility. Three levels of innovation consumer utility are identified. They are: formal utility, purchase utility and consumption utility. The levels of forming utility of a new product are considered and the features of this process are defined in terms of traditional marketing concepts.

The authors justify technology of the innovation consumer utility formation according to stages of the innovation process to provide successful innovation activities. Particular attention is paid to the definition of mutually motivating mechanism of distributing the innovation utility effect between two most important subjects of value creation: the consumer and the manufacturer. To implement this mechanism, the author proposes to use an approach to determining the necessary coefficient of relative reduction in cost per unit. The maximum value of the coefficient corresponds to the case when all the economic effect of products utility increase is received by the manufacturer. At the same time the consumer receives no additional cost reduction per unit of product utility effect.

Key words: innovation consumer utility, levels of innovation consumer utility, stages of the innovation process, pricing for innovative products, beneficial effect on producer.

Л. С. Лісовська

Національний університет “Львівська політехніка”,
кафедра менеджменту організацій

ФОРМУВАННЯ КОРИСНОСТІ ІННОВАЦІЙ

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Розкрито зміст поняття споживчої корисності інновації, зокрема виділено три рівні: формальну корисність, корисність придбання, корисність використання. Також розглянуто рівні формування корисності нового товару, означено особливості цього процесу у термінах традиційної маркетингової концепції.

Для успішної інноваційної діяльності автори обґрунтовують технологію формування споживчої корисності інновації за етапами інноваційного процесу. Особливу увагу, на думку автора, слід приділити визначенню взаємомотивуючого механізму розподілу корисного ефекту від інновації між двома найважливішими суб'єктами створення цінності: споживачем та виробником. Для реалізації такого механізму автор пропонує підхід до визначення необхідного коефіцієнта відносного зменшення витрат на одиницю корисного ефекту у споживача. Максимальне значення коефіцієнта відповідає випадку, коли весь економічний ефект від підвищення рівня корисності продукції одержує виробник, а споживач не отримує додаткового зниження витрат на одиницю корисного ефекту від продукції.

Ключові слова: споживча корисність інновації, рівні корисності інновації, етапи інноваційного процесу, ціноутворення на інноваційну продукцію, корисний ефект у виробника.

Statement of the problem

The business entity directly or indirectly involved in the development and implementation of innovations is successful and competitive. The degree of involvement in the innovation process determines the level of competitive advantage, providing innovation to the business entity.

Innovation is the result of long-term and comprehensive cooperation between a large numbers of participants of the innovation process. In modern scientific publications these participants are known as the stakeholders [2, p.45]. Innovation as the result of the innovation project should be a balanced reflection of all of its stakeholders' values, creating conditions for future beneficial cooperation [3, p.38]. Traditionally, the most involved stakeholders of the innovation process are consumer and producer. Between these business entities mutually beneficial cooperation should be established first of all. An effective mechanisms of benefits from consumer innovation use distribution, same as manufacturer's beneficial effect distribution on production and purchase of innovations should be developed.

Innovative activity significantly increases the uncertainty level in dynamics and performance of the organization. The analysis of the research and development volumes held in Ukraine and the volumes of innovative products manufacturing ratio shows the absence of an effective producer motivation mechanism to new product, of a higher consumer utility level than the competitors' innovations or the existing (traditional) products, creation and promotion.

Analysis of recent research and publications

The problem of the product's utility is repeatedly considered in works of Ukrainian economists [4, 5, 6], particularly in context of consumer needs, goods utility, goods value, customer satisfaction level etc. The authors unanimously believe that the usefulness of the product is a subjective value, because its admeasurements depend on the perception, specific needs and expectations of the person.

Modern research shows the need of change in emphasis from traditional marketing concepts of added consumer value creation to the concept of joint producer and consumer value creation [5, p.75].

The formulation of objectives

Analysis of current innovation, marketing, quality management and project analysis theories suggests the complexity and multidimensional nature of the innovation utility forming process management problem. Due to the differing vectors of interests these issues for both: producers and consumers should highlight, as well as intersection points to ensure the rational parity should be found.

The problem of innovation's utility formation by the stages of the innovation process we consider to be relevant and necessary for domestic business entities.

The **goals of current research** are the innovation's consumer utility formation technology grounding taking under consideration the stages of the innovation process, same as the approach for the innovation beneficial effects distribution between producer and consumer determining.

Presentation of main materials

The term "utility" means the ability to meet the specific needs of the individual. The consumer's valuation of the beneficial effects of certain economic goods is the subjective utility. Public utility is established in conditions of supply and demand equality for the product and could be measured with the equilibrium price. This utility can be called objective. In case when the consumer value has only one useful property it is the same as the public consumer value.

Speaking of products usefulness to consumers (consumer utility), the expected value and the value gained while consumption should be distinguished. Customer's expectations regarding the value offered to him with the value received by the client should not be confused. The value obtained should be evaluated in terms of the costs incurred by the consumers or the costs they are ready to incur in meeting their needs. Formalization of this statement can be represented as:

$$\text{Product's value} = \frac{\text{Product's utility}}{\text{total money, time, effort costs}} = \Rightarrow \max$$

Consumer utility changes over time, covering the whole process of procurement, use and disposal of goods to customers. Both enterprises: developer and manufacturer should take into account so-called product life cycle, starting with the definition phase of consumer needs and expectations of the market. Product's consumer utility formation can be characterized by following levels (fig. 1).

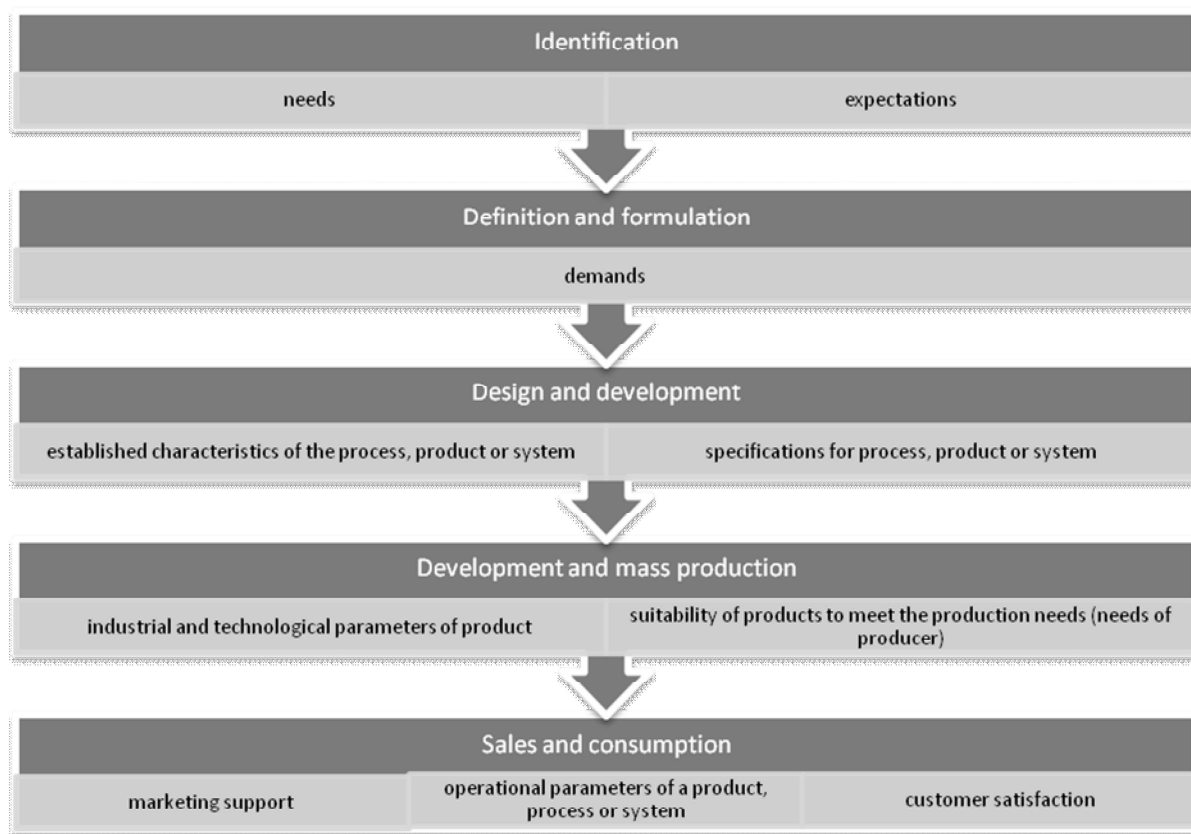


Fig. 1. The general sequence of product's utility formation by producer
Source: author's elaboration

Innovation is a commodity that can be introduced in the market as an innovative product or product innovation. Innovative products special features presented in the Law of Ukraine “About the innovation activity” [1, paragraph 14, paragraph 15] and in the in scientific papers [7, p.163] are following: market novelty, long-term nature of the need for innovation or even no market need, a high degree of uncertainty in the market and risk that accompanies innovation, separation in time between the cost and the result, the ability to significant income multiplying in the implementation, focus primarily on the consumers – the innovators needs, the inability to use the product without proper knowledge and informing consumers.

Innovation's utility is the ability of good to meet new consumer needs or satisfy existing needs in new ways. Innovation's consumer utility is a part of the innovation's customer value that is tied both to additional benefits and additional costs [8, p.30]. Because innovation is introduced as opposed to existing products, its consumer utility should be higher than the utility of traditional product.

Consumer utility is changing in time, covering the whole process of procurement, use and disposal of goods. Consumer utility is formed on the multiple attributes basis and can be characterized by the following levels (fig. 2).

Consumers are motivated by the possibility of obtaining additional benefits from using the product. Consumer utility changes over time, covering the whole process of procurement, use and disposal of goods. Both enterprises: developer and manufacturer should take into account so-called product life cycle, all benefits and costs, which appear at the time.

The use of innovation utility level depends on the form of ownership and terms of innovation use. It can be argued that an innovation has four levels, each of which is formed at a certain stage of the innovation process.

The innovation process is a circumference of new scientific and technological ideas, knowledge, information concentration and implementation, which form “science – production – market” chain. This chain spans fundamental theoretical research, applied research work, experimental development, building and improving new products production, new services. Flexible innovation management system creation

contributes to the creation and implementation of innovations of higher utility for consumers. Therefore, a special role is determined to the feedback information from goods and services market to innovative proposals stage. Therefore, it is advisable to elaborate on the question of new product utility formation mechanism development that should be established at all stages of the innovation process.

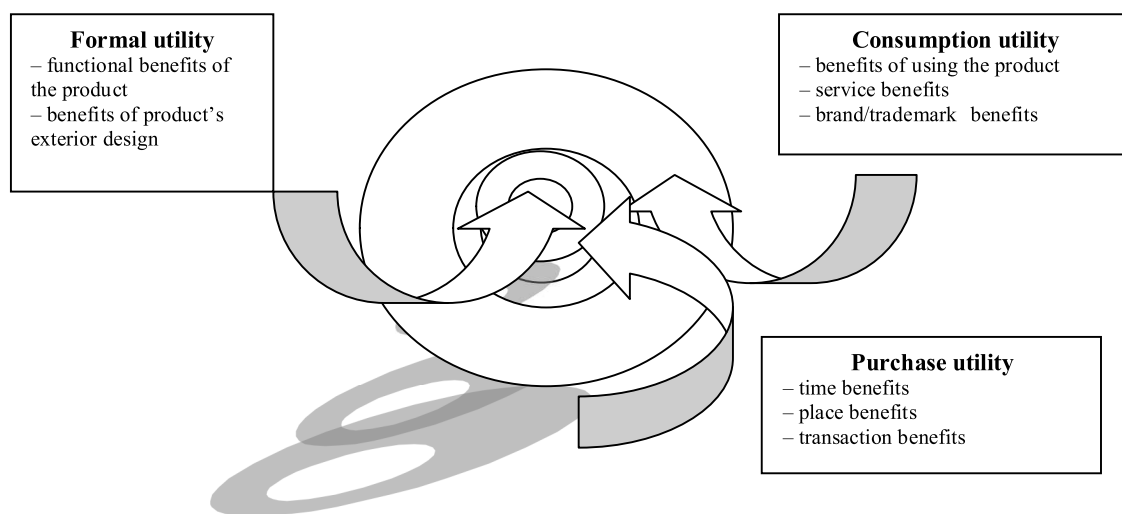


Fig.2. Product's consumer utility levels
Source: author's elaboration

Phasic nature of innovation cycles and stages of innovation creation deserves special attention, because this approach suits production process the best and can effectively distinguish intermediate and final technical and economic results.

Novelty of innovation utility is projected, justified and formalized in marketing research and research and development stages. The processes of production, marketing and logistics increase the level of R&D product utility, creating final goods (or services) value to the consumer. Formal utility is formed through experimental development and materialized at the stages of production preparation and development, same as the stage of the market trials. Innovation's purchase utility is formed at the stages of its distribution and promotion at the market.

Logistics solutions, from the standpoint of time utility, are mostly performed by maintaining a reasonable level of inventories in the distribution networks and the strategic placement of products and services. In some cases, the time utility can be formed by transporting through the rapid movement of products to the places of demand occurrence. Marketing provides purchase and possession utility through the tactical and strategic measures use. Innovation's purchase utility is implemented at the stage of innovation use by consumer and while additional services are provided.

For the business entity it is rationale to justify innovations development and production permanently, and the accuracy and objectivism of such grounding should be determined with the effectiveness of economic activity in general. Therefore, this grounding should be considered more complex and compound problem.

Solving these problems can be described as the definition of technical and economic efficiency of new products. The technical and economic efficiency of new products means their objective assessment to establish the minimum requirements essential to production goods of the required quality at the lowest total expenditures of social labor and the basic parameters of these products improvement.

According to the Law of Ukraine "About enterprises" in Ukraine in all types of enterprises profit is the major financial summary of the economic performance. There for it must be a relationship between innovation's customer value and producer's profit. The direct correlation between profit and savings of public works is obvious: the greater these savings are, the lower the social cost of production (product cost) is, same as the higher public revenue becomes. Another question is how these savings are distributed between the manufacturer, whose production costs for new products may increase, and the consumer, whose relative operating costs (per unit of useful effect) may be reduced [9, p.147].

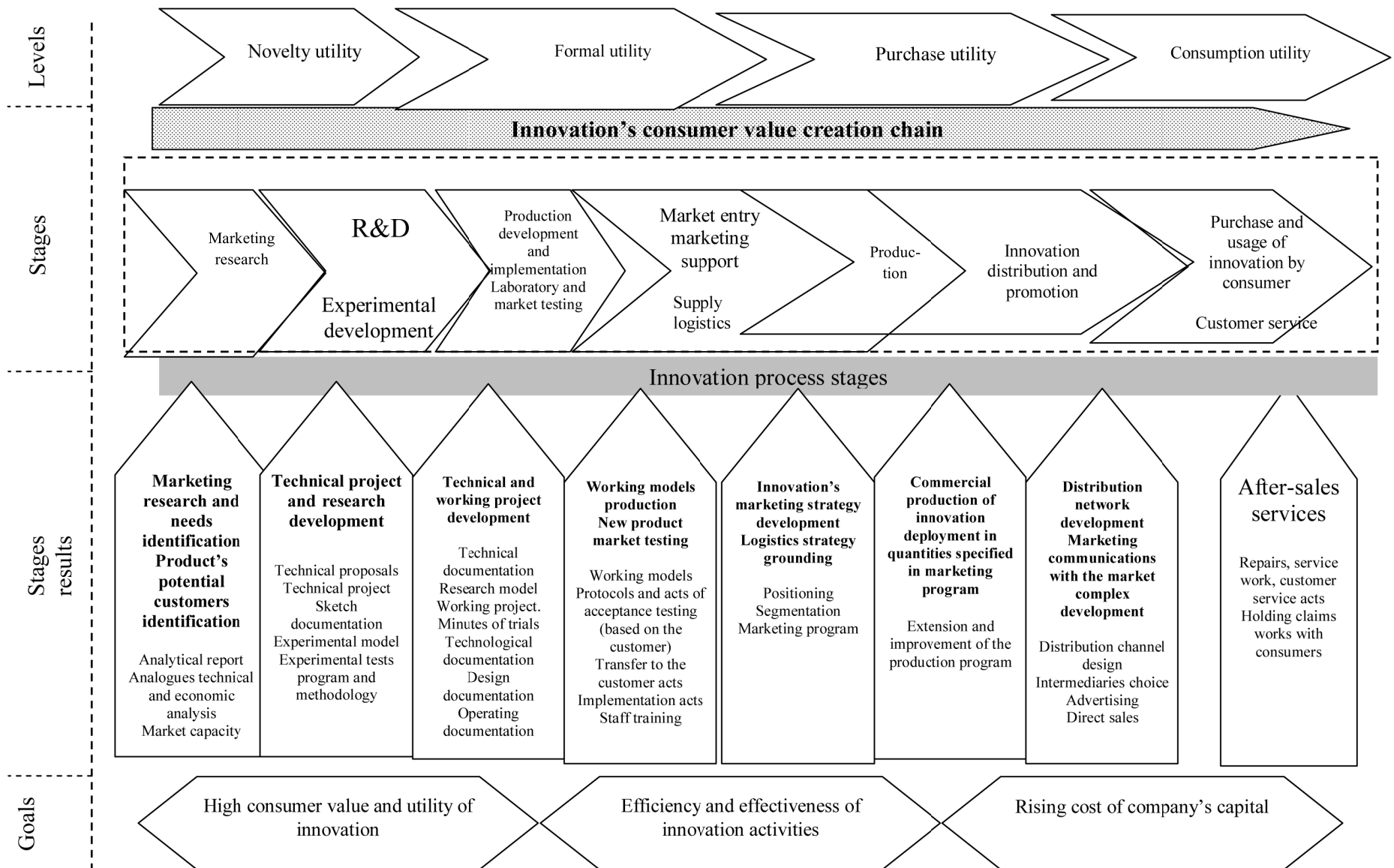


Fig. 3. Innovation utility formation the stages of the innovation process, Source: author's elaboration

This pricing mechanism can be considered as the approach that will allow settling and establishing parity between the consumer and the producer of innovation. Pricing mechanism should work also as the feedback, when the company receives a certain benchmark or a hint about the direction of following activities through it, including the changes in the nature and quality performance of company's products [10, p.301].

Quality improvement means better needs satisfaction or expansion of the needs satisfied incurring the same (or sometimes higher) operating costs from one hand or reducing operating costs to meet the previous requirements from the other hand. Both approaches cause consumer spending per unit of beneficial effect reduction, namely a positive economic effect (saving) when using products. So, between the categories of "value change" ("cheaper", "more expensive") and "utility change" ("better", "worse") there are only six dependence options [9, p.150].

Product's price per unit increasing (at least – not decreasing) with current level of utility caused by innovation is the economic optimality criterion of innovation development and implementation for producer. On this the efficiency ratio can be considered as following:

$$\Delta P \geq 0, \quad (1)$$

where ΔP – producer profits change as the result of innovative products purchase, measured in currencies.

ΔP magnitude could be determined by the following formula:

$$\Delta P = (B_{2prod} - B_{1prod}) \times O_{2prod}, \quad (2)$$

where B_{1prod} – product's price per unit with the utility level before the innovation, measured in currencies per unit; O_{2prod} – innovative products purchase capacity, measured in units.

Economic optimization criterion is determined from the formula of the innovative products purchase price:

$$B_{2prod} = B_{1prod} \times \Pi_{util} \times a, \quad (3)$$

where a – relative cost reduction per unit of consumer's beneficial effect coefficient, dimensionless.

Studies have shown that a coefficient is used in the centralized prices regulation. Thus, according to regulatory and methodological recommendations for products with improved technical and economic parameters limit prices calculation relative price reduction coefficient, which guarantees lower prices per unit of beneficial effect, was 0,85. In order to encourage the use of new B to B machine building products at least 30 % of the beneficial effects was predicted, while determining its wholesale prices, to give to consumer. That is a coefficient equal to 0.7 [11].

According to the approach adopted in [12, p.128], a coefficient differentiation on an industry the design stage of new products basis at the rate of 0.85 or 0.7 is proposed.

In theory, a coefficient market pricing can be within $a \in (0;1]$.

On the basis of economic criteria (1) and the interests of consumers, the range of a coefficient optimal values is defined.

When all the economic effect of product utility raise receives the consumer and the producer's profit remains unchanged ($\Delta P = 0$), a coefficient takes minimum value.

Index Π_{util} is given by the following formula

$$\Pi_{util} = \lambda_f \Pi_f + \lambda_p \Pi_p + \lambda_c \Pi_c, \quad (4)$$

where Π_f – integrated indicator of product's formal utility, dimensionless; Π_p – integrated indicator of product's purchase utility, dimensionless; Π_c – integrated indicator of product's consumption utility, dimensionless; $\lambda_f, \lambda_p, \lambda_c$ – group weight ratios of integrated indicators of product's formal, purchase and consumption utility level. They are defined with the expert method based on the conditions

$$\lambda_{fk} + \lambda_c + \lambda_m = 1. \quad (5)$$

Based on the formulas (2), (3) and conditions ($\Delta P = 0$), we obtain the following

$$a_{min} = \frac{1}{\Pi_{util}}. \quad (6)$$

The maximum value of the a coefficient corresponds to a case where all the economic effect of the product's utility level increasing receives the producer, while the consumer receives no additional cost reduction per unit of the product useful effect. Thus, consumer becomes indifferent to the product's utility level before and after improvement

$$a_{\max} = 1. \quad (7)$$

Thus, a coefficient optimal values interval will be in the following ranges

$$\frac{1}{\Pi_{util}} \geq a < 1. \quad (8)$$

a coefficient value, during products with a higher utility level prices setting, grounding is caused by the following factors: competition severity degree in the market (with severity increasing a coefficient value should be reduced); prestige brand and producer's reputation among consumers (with their growth the company can consider the competition least, therefore, so a coefficient value may be higher), stage of product life cycle (for example, during demand recession a coefficient value can draw near the minimum), industrial and commercial, innovative potential of enterprises (the existence of high-level potential a coefficient value is growing), marketing strategy of the enterprise (for example, when entering a new market a coefficient value could be higher), product features (with the proliferation of similar or substitute products a coefficient value decreases) consumer needs and demand level (high level of unmet demand allows producers increase the a coefficient value).

This approach to the innovative products prices setting can be used only under conditions of marginal changes in the technology of traditional products, namely for improving innovation.

Conclusions

Based on the research the following conclusions are made.

Innovation development and implementation for producer ensures long-term competitive advantage. Constant monitoring of the process of determining consumer utility innovation should be seen as essential element of innovation process, as far as its prediction and creating reliability determines business entity market performance.

The concept of innovation's consumer utility is part of a new product customer value and includes additional costs and additional benefits to the consumer relatively to the existing product utility.

Innovative products prices setting should be considered as part of the motivation for both the consumer and the producer, which ensures optimal mutual benefit from innovation value creating.

Prospects for future research

Innovation consumer utility formation occurs at all stages of the innovation process and the efficiency of utility formation is provided with cooperation and collaboration between business units same as between participants of innovation consumer utility formation chain. In next studies, it is advisable to consider and develop the technology of the consumer utility formation, in particular to prove optimality criteria and to determine the factors of its implementation.

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L. M. Logachova, O. V. Logachova*

Institute of Industrial Economics of NAS of Ukraine, Donetsk,

**Donetsk National University,*

Management Department

STRATEGIC DIRECTIONS FOR SUSTAINABLE DEVELOPMENT OF UKRAINE

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The article investigates the European Union's ten-year growth strategy named Europe 2020. Attention is focused on the key indicators of climate change and power engineering. The current state and dynamics of greenhouse gases emissions indicators in Ukraine are compared with those in EU countries. The specific recommendations for the implementation of environmental policies at the regional level are proposed.

Key words: strategy, sustainable growth, climate change, renewable energy, environmental policy.

Л. М. Логачова, О. В. Логачова*

Інститут економіки промисловості НАН України, м. Донецьк,

**Донецький національний університет,*

кафедра менеджменту

СТРАТЕГІЧНІ ОРІЄНТИРИ СТАЛОГО РОЗВИТКУ УКРАЇНИ

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Розглянуто економічну стратегію європейського розвитку "Європа 2020". Акцент зроблено на ключових індикаторах у сфері зміни клімату та енергетики. Проаналізовано сучасний стан та динаміку показників емісії парникових газів в Україні порівняно з країнами Європейського Союзу. Запропоновано комплекс заходів з реалізації екологічної політики на регіональному рівні.

Ключові слова: стратегія, сталий розвиток, зміна клімату, відновлювані джерела енергії, екологічна політика.

Statement of the problem

At the beginning of XXI century there was specific conception formed, which contains the modern idea of the international community on ways about delivering sustainable growth. Most of these priorities have been formulated and made by public and politicians, environmentalists, economists, sociologists, biologists, and other professionals, proving comprehensive nature of the problem and its importance to society.