THE ECONOMIC COMPONENT OF RECYCLING AT THE SUGAR FACTORY

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Recycling of industrial waste is an important reserve for saving material resources, reducing energy intensity of production, improving eco-social situation in the area where the plant is situated. Most of by-products and production wastes, generated during raw materials processing, characterized by valuable chemical composition and can be used for making various products, re-raw materials or like energy. By taking into account the environmental efficiency it is possible to reduce material consumption of goods and services, to reduce energy intensity of goods and services, to provide long-term use of renewable resources, to extend the life of the product, etc. [4, p.3]. Foreign authors among the most important efficiency indexes of the company clearly distinguish the performance of materials, efficiency of the energy cycle, overall efficiency of the environmental impact [5, c.236].

However, methodological approaches to environmental and economic efficiency are not determined, so the author believes it is necessary to apply the following approach, which will comprehensively cover the problem of increasing of the overall efficiency of recycling.

The author proposes to calculate this indicator using data of processing wastes of sugar production into biofuel. In particular biogas is a mixture of about 65% of methane (CH4), 30% of carbon dioxide (CO2), 1–2 % of hydrogen sulphide (H2S) and minor impurities of nitrogen (N2), oxygen, hydrogen and carbon monoxide (CO). According to current approaches it is classified as a type of non-traditional utilized heat energy. Energy in amount of 28 m3 of biogas is equivalent to 16.8 m3 of energy of natural gas, 20.8 liters of oil or 18.4 liters of diesel fuel. The mentioned gas is formed by anaerobic fermentation of organic sugar factory wastes of different origin.

This model is completely describes both economic and ecological components of the indicator. Looking on the block can be stated that economic efficiency of recycling is quite a significant indicator, because efficiency with no direct impact on the financial result can not be counted. Any project can be implemented if there is a high probability of obtaining of future benefits, which should be greater than alternative investments for the same investment risk.

As stated above economic component of efficiency is nothing else as an expression of benefits by investing some capital. For ecological and economic efficiency of recycling its economic component is nothing else as the actual saving of energy means energy, obtained by recycling of own waste. So at the determination of a component it can be stated that the difference in the price of natural gas and cost of biogas produced by its own is reduction of the cost of direct material costs in the cost structure of sugar.

Consider in more details the indicators that should be used in calculating of the economic component of environmental and economic efficiency of the sugar factory.

The price of natural gas \( p_n^g \) formed by state enterprises in view of a number of factors (political, economic, etc.) and regulatory acts of the Cabinet of Ministers of Ukraine and the National Commission for State Regulation of Energy. To component of the pricing mechanism for natural gas can be considered the following indicators, the sum of which is the full price of natural gas for the sugar refinery in a given period:
- ceiling price for natural gas which is implemented to industrial customers and other business entities;
- the total tariff for transportation of natural gas excluding value added tax (VAT);
- calculated average tariff for transportation of natural gas by main pipelines;
- the average weighted tariff for transportation of natural gas through distribution pipelines;
- tariffs for transportation of natural gas by main pipelines to consumers, own pipelines of whom are directly connected to the main gas pipelines;
- the average weighted tariff for supply of natural gas.

The first step in the method of calculation of environmental and economic efficiency of waste recycling is to determine the power inputs and energy needs. Now at sugar plants can be determined the total amount of need...
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for energy resources in gas consumption at CHP plants, electricity in manufacturing and fuel and lubricants during transportation of raw materials.

The economic expenses of energy (EEₚ) per unit of production (2) and per unit of income (3) are defined by the ratio of the sum of all costs of purchase, shipping and procurement of energy (TCₚ) to the amount of sugar produced (Qₛ) and total income from sale of goods (TR). Part of the total expenses (TC) is the cost. The cost is expressed in cash operating costs, which aiming at the manufacturing of product. Expenses for production make up the production cost [1, s.263]. In our case it is waste recycling in order to receive new kind of production - own power.

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EE_x^Q = \frac{\sum TC_p^E}{Q_s},
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EE_x^R = \frac{TC_p^E}{TR}
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The next important step in the methodology of determining the environmental and economic efficiency is the choice of alternative waste recycling projects in the sugar factories. One of the modern and effective methods for selecting alternatives in the economic environment is the method of NPV.

So at sugar factories must be given enough attention to recycling of waste, that is why this issue requires careful study. The basis of valuation of the investment project for waste processing in a sugar factory should provide a comparative analysis of the amount of the proposed investments and future cash flows. Comparable values belong mostly to different time periods and thus the most important problem in this case, as well as in determining the cost-effectiveness of new technology, is the problem of comparing income and expenses and bringing them to the comparative form. The causes of the process of discounting (bringing to the comparative view) may be inflation, undesirable dynamics of investments, reduction of manufacturing output, different horizons of prediction, changes in the tax system and other factors.