

Gavrilenko V.A., Professor, Doctor of Economics, Head of the Department of Accounting and Auditing  
(Donetsk National Technical University)  
Chernikova E.G, assistant lecturer in Accounting and Auditing  
(Donetsk National Technical University)

Scientific research in the field of accounting, control and analysis: status, problems, guidelines

## IMPROVED METHODS FOR ESTIMATION OF BY-PRODUCTS AT COKING ENTERPRISES

Currently, accounting departments at the coking enterprises when costing their products face the problem of expense allocation between the main product and by-products, determination of objective evaluation of by-products and the processed products thereof.

In accordance with Paragraph 607 of Guidelines No. 373 [1] coking enterprises use the calculation method of expense elimination. However, the reliability of this method depends on the adopted estimates of by-products and on the list of main products and by-products. The main disadvantage of this method is also that only the main product is calculated, and the by-product is estimated by firm evaluations on the basis of internal regulations of the enterprise (for example, resin in gas, benzol in gas, crude coke oven gas - on the basis of the estimates approved in the previous planning period and increased (decreased) by an index of more expensive (cheaper) cost of coals in the planning period.

Shortcomings in accounting of by-products at the coking enterprises result in stimulation of production of main products only which has a higher price and in refuse to process the by-product (coke oven gas). And this will entail downtime of by-product-recovery shops of the plant, reduction of the company's profits due to overstatement of the main product cost (blast-furnace coke).

General principles of recognition, accounting and estimation of by-products are set forth in Accounting Standards No. 9 "Inventories" [2], No. 16 "Expenses" [3], Guidelines No. 2 [4] and No. 373 [1].

Industrial enterprises should develop their individual calculation methodology based on these documents. However, the most coking enterprises in their accounting policy have no methodology for economic assessment of cost estimation of by-products and equitable distribution of costs between the production department and the products.

By-product is a product (a result of a manufacturing process) to be obtained simultaneously with the main product, i.e. in a single technological process, or to be made from waste materials. It is referred to inventories of the company and recognized as assets in accordance with paragraph 5 of Standard 9 "Inventories", if:

1. there is a probability that the company will receive in the future the economic benefits associated with its use;
2. Its cost can be determined precisely.

If the recognition of a by-product is economically justified and there is an active sales market for it, then there is no doubt that the company will receive economic benefits from its use. As for precise determination of the by-product cost, there are difficulties associated with impossibility of cost calculation for the by-product in the production process. Thus, in accordance with Section 429 of Guidelines No. 373 the by-product is not calculated alone, and its cost to be calculated at fixed prices, is deducted from the cost of the main product.

Estimation of a by-product includes the following methods of Standard 16 "Expenses", Clause 11:

1. At the fair value. Determination of the fair value is given in paragraph 4 of Standard 19 "Business Combination" [5], but only with regard to a finished product. Fair value is calculated as the selling price minus distribution costs and the mark-up (profit) amount based on the mark-up (profit) for a similar finished product.

2. At the price of possible use. It should be noted that this concept is not included in the existing standards. In this connection, to evaluate a by-product you can use paragraph 2.12 of Guidelines No. 2: "Inventories... shall be entered at the estimate of possible use thereof which can be determined based on the value of similar inventories, if available on the company's balance, with the extent of their operational suitability".

In conditions of unclear specified calculation methods for the price of possible use of a by-product the following approach is proposed:

$$Q_{f.v. \text{ by-prod.}}^{\text{forecast}} = Ex_{\text{prod.}}^{\text{actual}} + C_{\text{second. r.mat.}}^{\text{standard}} + Q_{f.v. \text{ by-prod.}}^{\text{forecast}} \times 0.2 \quad (1)$$

where,  $Q_{f.v. \text{ by-prod.}}^{\text{forecast}}$  – is the forecasted sales of the by-product at fair value, in UAH;  
 $Ex_{\text{prod.}}^{\text{actual}}$  – is the actual production expenses for 1 ton of the by-product excluding the secondary raw materials cost, in UAH;

$C_{\text{second. r.mat.}}^{\text{standard}}$  – is the standard cost of 1 ton of secondary raw materials from which the by-product is produced, in UAH;

$Q_{f.v. \text{ by-prod.}}^{\text{forecast}} \times 0.2$  – is the rate of return of 20 percent in the selling price of the by-product, in UAH.

Thus, the formula for cost determination of 1 ton of secondary raw materials from which the by-product is produced will look as follows:

$$C_{\text{second. r.mat.}}^{\text{standard}} = Q_{f.v. \text{ by-prod.}}^{\text{forecast}} \times (1 - 0.2) - Ex_{\text{prod.}}^{\text{actual}} \quad (2)$$

It should be noted that understatement of the by-product evaluation can result in ungrounded cost overstatement for the main product.

In contrast to the accounting standards, paragraph 431 of Guidelines No.373 offers two additional estimation methods for the by-product:

1. At the planned cost of a similar product.
2. At the standard cost.

Both of these methods are presented without any description of methodology and application features.

Formation of the system of accounting, operational control and cost management will be facilitated by separation of the by-product processing into an individual production. That should ultimately result in formation and development of motivation system to achieve the final result and cost-effective use of resources.

#### Referenced literature sources:

1. Guidelines for product (work, service) cost formation in industry, approved by the Order of the Ministry of Industrial Policy of Ukraine, No. 373 dated 09.07.2007.
2. Accounting Regulation (Standard) 9, "Inventories", approved by Order of the Ministry of Finance of Ukraine No. 246 dated 20.10.1999.
3. Accounting Regulation (Standard) 16 "Expenses", approved by Order of the Ministry of Finance of Ukraine No. 318 dated 31.12.1999.
4. Guidelines for accounting of inventories, approved by Order of the Ministry of Finance of Ukraine No. 2 dated 10.01.2007.
5. Accounting Regulation (Standard) 19 "Business Combinations", approved by Order of the Ministry of Finance of Ukraine No. 163 dated 07.07.1999.