

IRSTI 82.33.13  
UDC 657.471.76

DOI 10.70239/arsu.2024.t77.n3.19

## THE PROCEDURE FOR CALCULATING THE COST OF PRODUCTION BY ECONOMIC ELEMENTS AND CALCULATION ITEMS ON THE BASIS OF AN OIL AND GAS ENTERPRISE

PANKOV D.A.<sup>1</sup> , IMANBAYEVA Z.O.<sup>2\*</sup> 

**Pankov Dmitry Alekseevich**<sup>1</sup> — Doctor of Economics, Professor, Head of the Department of Accounting, Analysis and Audit in the Branches of the National Economy of the Belarusian State University of Economics, Minsk, Republic of Belarus

E-mail: [d.pankov@lund-univer.eu](mailto:d.pankov@lund-univer.eu), <https://orcid.org/0000-0003-2898-7225>

**\*Imanbayeva Zauresh Otegenkyzy**<sup>2</sup> — Candidate of Economic Sciences, Associate Professor, Associate Professor of the Department of Public Administration, Finance and Marketing of Aktobe Regional University named after K. Zhubanov, Aktobe, Kazakhstan

E-mail: [utegen\\_z\\_78@mail.ru](mailto:utegen_z_78@mail.ru), <https://orcid.org/0000-0001-6604-4135>

**Abstract.** The oil and gas sector is the most important structural component of the economy, one of the main factors of labor productivity growth, productive forces and vital activity of the country's population. It provides all the sectors of the economy and the population with natural gas, a wide range of motor fuels, fuels and lubricants, raw materials for petrochemicals, boiler-furnace fuel and other petroleum products. The oil and gas complex has a decisive impact on the socio-economic development of the country and its individual regions, is actually a donor for the entire economy of the state, contributes to the development of other sectors of the economy. The work of the oil and gas complex enterprises is associated with the implementation of the most important social programs on the scale of the regions and the whole state, which is the basis of economic development and largely determines the economic independence of the country, the raw material base of modern industry cannot be imagined without oil and gas. Oil and gas are not only an economical energy fuel, but also an indispensable raw material for the petrochemical industry.

The article discusses the importance of the oil and gas complex and the need for effective cost management at oil and gas enterprises. The necessity of an integrated approach to cost management is substantiated. The directions of improving the cost management system for oil and gas complex enterprises are formulated, the calculation of the cost of oil and gas is provided.

**Key words:** oil and gas industry, costs, cost of production, unit of calculation, oil, gas, the process method

### Introduction

The cost of oil and gas production refers to the cost of natural resources, reagents, materials, fuel, energy, capital equipment, depreciation of labor resources and other costs used in the process of oil and gas production.

The composition, classification and grouping of costs of oil and gas production enterprises are determined by the following main features:

- the technological process of simultaneous production of two products: oil and gas, as well as the need to divide the total costs between them;
- with the production of only finished products and the absence of unfinished production and semi-finished products;
- consistent implementation of the main production processes: reservoir pressure maintenance, production from wells, oil and gas collection and transportation, complex oil preparation (gas separation, dehydration, desalination, and oil stabilization), production and disposal of industrial waste water, oil and gas external drive;
- implementation of the main technological processes in an automated mode;
- Deterioration of mining geological conditions due to exploitation of the field and decrease in the flow rate of wells, putting a large number of wells into inactivity or conservation due to their inefficiency, increase in the cost of oil and gas production.

In order to bring the wells out of inactivity and increase the volume of oil production, it is necessary to carry out a large amount of geological and technical activities (GMT) and overhaul of wells (IMM).

Calculating the cost of oil and gas production is based on approved field development projects,

a unit of oil and gas produced by the enterprise, a well of the existing stock, one repair, etc. b. established regulatory costs, service standards, wage rate agreements, depreciation rates, etc. b. is based on.

The oil industry produces only finished products, so there is no work in progress. This greatly simplifies and affects the calculation of the cost of the product [1].

In a single non-separable technological process, two types of products are obtained: oil and gas. Gas, in turn, is divided into natural and associated.

Therefore, in the field of oil and gas, the object of accounting of expenses that can be attributed directly to the cost price is the mentioned types of products. Accounting is carried out separately:

- on oil production;
- accompanying gas production;
- production of natural gas.

In the oil production industry, costs and costing objects conditionally correspond.

Calculation unit:

- 1 ton of oil;
- 1000 m<sup>3</sup> of accompanying gas;
- 1000 m<sup>3</sup> of natural gas.

Oil and gas production enterprises use a single limit (partial) method of calculating the cost of oil and gas. It depends on the technological process of production, the method of collecting production costs and the order of adding them to the cost of the product.

#### **Methods**

According to the manual on planning, accounting and calculation of the cost of oil and gas production, production costs are recorded according to a certain nomenclature of costs (Table 1).

Table 1. Cost nomenclature

Articles	Meaning
Energy costs for oil production	Appears during equipment maintenance - the cost of energy used for production needs
Costs of artificial exposure to the layer	Depending on the specifics of production Costs of pumping water, air into the reservoir and measures to increase oil production of reservoirs: depreciation of pumped wells and equipment, costs of water, gas, electricity, chemicals, etc. b. cost.
Basic wages of production workers	Salaries of operators, technologists and technologists
Transfers for social needs	A social tax set at a certain percentage in the legal framework
Depreciation of wells	By type of wells: oil, gas, monitor, rater and monitor
Expenses on technical preparation of oil	Maintenance costs of oil refining facilities
Production preparation and development expenses	Costs for preparatory work of a non-complex nature
Equipment maintenance and operating expenses	Depreciation and maintenance of surface and underground equipment of wells; the cost of materials and other costs necessary for current maintenance of the equipment
General production costs	Costs associated with oil production and of a production nature
Other expenses	Expenses for geological exploration, scientific research and experimental work, etc. b.

To calculate the full cost, commercial costs are added to production costs, which reflect the costs of transporting oil and gas to the main oil pipeline.

Monthly cost allocation statements are prepared to allocate costs between oil and gas

production. Rent calculations are made for all types of manufactured products.

Let's give a conventional example of costing in the oil production industry. To calculate the cost of oil and gas, you need the following:

- 1) Distribution of main expenses between oil and gas production;
- 2) Distribution sheet of additional salary and photo transfers between oil and gas production;
- 3) distribution of production costs between oil and gas production [2].

On the basis of these documents, it is possible to calculate the cost of oil and gas production in the reporting period.

Let's show in Table 2 certain pre-collected expenses, which include the main expenses of the enterprise in the current month and which we have grouped in the table.

Table 2. Excerpt from the statement of expenses for oil and gas production

List of expenses	Soma, m
Wages were calculated for production workers	20000
Depreciation was calculated for the wells	900
Production preparation and development expenses	3000
Costs of artificial exposure to the layer	4500
Additional salary was calculated	5000
Oil collection and transportation costs	1500
Spare parts for equipment repair are excluded	200
Internal production cost of gas	150
Expenses on technological preparation of oil	2500
Transfers to research works	6000
Total production costs	12000

Oil and gas production in the reporting month is presented in table 3 with the given data.

Table 3. Total and commercial production of oil and gas during the reporting period

Product type	General production, etc	Commodity production, m
Oil	200	100
Gas	300	200
Everything	500	300

According to production costs, some of them cannot be attributed directly to the cost of oil or gas. The allocation base for these costs in the petroleum industry varies depending on the type of cost being allocated. This can be total production costs minus total oil and gas production, commodity production, base wages of production workers, research and exploration costs.

### Results

We recommend solving this problem step by step.

1. We found in table 4 the costs of oil and gas in general

We divide proportionally to production. For this, we calculate the specific weight of oil and gas in the total volume of production.

Table 4. List of major cost allocations between oil and gas

Output type	Total amount, m	Costs for oil, m	Costs for gas, m
Wages of production workers	20000	8000	12000
Depreciation of wells	900	360	540

Production preparation and development expenses	3000	1200	1800
Expenditure on construction and operation of devices	200	80	120
Transfers to research works	6000	2400	3600
Everything	30100	12040	18060

We divide the amount of oil produced by the total amount of oil and gas production. We do the same with the volume of gas production.

Specific weight of oil:

$$200 / 500 \cdot 100 \% = 40 \%$$

We calculate the specific gravity of the gas in the total volume in the same way:

$$300 / 500 \cdot 100 \% = 60 \%$$

The total amount of interest must be equal to 100%.

Each item of expenses shown in Table 12 should be multiplied by the percentage found for each item of expenses to be attributed to the cost of oil and gas. For example, we divide the basic salary of production workers as follows:

- costs for oil:

$$20000 \cdot 40 / 100 = 8000$$

- gas costs:

$$20000 \cdot 60 / 100 = 12000 \text{ m.}$$

2. Expenses on additional salaries and wages

(social tax) transfers proportionally to the basic salary of production workers (Table 5).

For this, you need to calculate the social tax:

$$(20000 + 5000) \cdot 35.6 / 100 = 8900 \text{ m.}$$

Table 5. Distribution of expenses on additional salary and social tax

Product type	Basic salary, m	Distribution percentage	Additional labor fee, m	Social tax, m
Oil	8000	40	2000	3560
Gas	12000	60	3000	5340
Everything	20000	100	5000	8900

3. General production costs research and geological exploration excluding transfers to the works, the cost of oil and gas is included in the cost of their production equal to the costs of their production [3].

For this purpose, we collect the costs allocated above by item (separately for oil and gas).

The costs of artificial exposure to the formation are fully included in the cost of oil (Table 6).

Table 6. List of expenses for oil and gas production

Expense items	Oil	Gas
Basic expenses	12040	18060
Expenses on technological preparation of oil	2500	
Costs of artificial exposure to the layer	4500	
Oil collection and transportation costs	1500	
Everything		18060
Research expenses	-2400	-3600
All expenses	18140	14460

We calculate the distribution percentages according to a known scheme.

Specific weight of oil:

$$18140/32600*100\% = 55.64\%$$

The specific gravity of the gas in the total volume is similar:

$$14460/32600*100\%=44.36\%$$

Table 7. Inventory of the distribution of general production costs

Product type	Total expenses, tenge	Distribution percentage	Total production costs, m
Oil	18140	55,64	6677
Gas	14460	44,36	5323
Everything	32600	100	12000

4. Based on the calculations, we will make a simplified calculation of oil and gas according to the expenditure items in Table 8.

Table 8. Excerpt from calculation of cost of oil and gas

Expense items	Oil	Gas
1	2	3
Costs of artificial exposure to the layer	4500	
Wages of production workers	8000	12000
Additional wages of production workers	2000	3000
Transfers to social funds	3850	5775
Depreciation of wells	360	540
Collection and shipping costs	1500	
Expenses on technological preparation of oil	2500	
Production preparation and development expenses	1200	1800
Construction and operation costs of the device	80	120
Total production costs	6677	5323
Other expenses	2400	3600
All are total manufacturing costs	32777	31723
Internal production costs		150
Everything is at cost	32777	31573

Thus, the cost of oil is 32777 m, and gas - 31573 m.

### Discussion

Currently, the term "cost accounting" is widely used, in financial accounting, the term cost is defined as an indicator in monetary terms of the amount of resources used to achieve a certain goal, in management accounting, the term cost is used in a number of different situations. Different types of costs are considered in solving different problems - some costs are considered for estimating resources and determining revenues, others are considered for Planning, budgeting and control, and third costs are necessary for decision-making for near and future prospects.

The grouping of costs by economic elements means the amount of current costs or turnover generated by the organization in this reporting period, regardless of whether the production of the product has been completed or the work has been performed. The importance of this classification increases depending on the amount of prerequisites for dividing the accounting system of enterprises into financial (accounting) and internal (production, management) subsystems.

A large proportion of the production cost of oil production is characterized by conventionally determined costs - depreciation of wells and other fixed assets, workshop and general business costs,

wages, costs for development and preparation of production, maintenance and use of equipment, etc.  
b

Process costing method (preliminary method of cost accounting, English. process costing) is a cost accounting method in which average costs are calculated for each produced unit in the reporting period. This method is used when many identical units of the product are produced and it is not necessary to determine the cost of each unit.

In this case, the products are produced equally and require the same distribution of direct and overhead costs[4]. Separate records of cost accounting are not maintained for individual orders, and the object of cost calculation is the product of each completed stage of processing (redistribution, process).

English professor Colin Drury defines the method of calculating technological costs as a method that calculates the average cost of each unit produced when the total costs spent on a product (service) in the reporting period are divided by the total number of products (services), produced for the same period [5].

### **Conclusion**

In petrochemical enterprises, depending on the nature of the production and the conditions of its organization, the calculation of the cost of the product is carried out by the process method and by order.

The greatest reduction in the cost of petroleum products can be achieved as a result of improving the use of raw materials. For this, it is necessary to choose and prepare raw materials, stabilize their composition, improve and stabilize the technological regime, correctly select catalysts, use cheap raw materials, reduce the cost of their production in previous processes, rational use of by-products. The use of raw materials is closely related to the struggle to reduce production costs. When improving the use of raw materials, the production of the target product is increased and cost savings are achieved in all cost items[6].

The introduction of production innovations will also contribute to reducing the cost of oil refining products; increasing the extensive and intensive use of the existing production facilities, reducing production service and management costs.

### **References**

1. Taigashinova, K. T. Calculating the cost of products, services and works: textbook / K. T. Taigashinova. - Almaty: LEM, 2014. - 324 pages.
2. Zhanbirov Z.G. Production organization and enterprise management: Textbook. - Almaty: Evero, 2014. - 372 pages
3. Tolpakov, J. Financial textbook-1: textbook. . Part II / J. Tolpakov. - Karaganda: LLP "Karagandinskaya polygraphia", 2013. - 408
4. Imanbaeva Z.O., Toktarova M.A. Accounting in industries. Textbook - "PrintA" publishing house, 2019. - 264 p.
5. Myrzagaliyev D.M. Oil and gas regions of Kazakhstan: Textbook. – Almaty: Evero, 2017. - 134 pages. <https://elib.kz/>
6. Kuzhukeeva, K.M. Financial accounting according to IFRS: Study guide. . - Kostanay: KSU im. A. Baitursynova, 2016. - 129

### **Әдебиеттер тізімі**

1. Тайгашинова, К. Т. Өнімдердің, қызметтер мен жұмыстардың өзіндік құнын калькуляциялау: оқу құралы / К. Т. Тайгашинова. - Алматы: LEM, 2014. - 324 бет.
2. Жанбиروف Ж.Ф. Өндірісті ұйымдастыру және кәсіпорын менеджменті : Оқулық. - Алматы : Эверо, 2014. - 372 бет
3. Толпаков, Ж. Финансовый учет-1: учебник. . Часть II / Ж. Толпаков. - Караганда : ТОО "Карагандинская полиграфия", 2013. - 408
4. Иманбаева З.О., Токтарова М.А. Салалардағы бухгалтерлік есеп. Оқу құралы – «ПринтА» баспаханасы, 2019. – 264 б.



5. Мырзағалиев Д.М. Қазақстанның мұнай және газды аймақтары: Оқу құралы.– Алматы: Эверо, 2017. - 134 бет.<https://elib.kz/>
6. Кужукеева, К.М. Финансовый учет в соответствии с МСФО : Учебное пособие. . - Костанай: КГУ им. А. Байтұрсынова, 2016. – 129

## МҰНАЙ-ГАЗ КӘСІПОРЫНЫ НЕГІЗІНДЕ ЭКОНОМИКАЛЫҚ ЭЛЕМЕНТТЕР МЕН КАЛЬКУЛЯЦИЯ БАПТАРЫ БОЙЫНША ӨНІМНІҢ ӨЗІНДІК ҚҰНЫН ЕСЕПТЕУ ТӘРТІБІ

ПАНКОВ Д.А.<sup>1</sup> , ИМАНБАЕВА З.О.<sup>2\*</sup> 

**Панков Дмитрий Алексеевич**<sup>1</sup> — экономика ғылымдарының докторы, профессор, халық шаруашылығы салаларындағы бухгалтерлік есеп, талдау және аудит кафедрасының меңгерушісі, Беларусь мемлекеттік экономикалық университеті, Минск, Беларусь Республикасы

**E-mail:** [d.pankov@lund-univer.eu](mailto:d.pankov@lund-univer.eu), <https://orcid.org/0000-0003-2898-7225>

**\*Иманбаева Зауреш Отегенқызы**<sup>2</sup> — экономика ғылымдарының кандидаты, қауымдастырылған профессор, мемлекеттік басқару, қаржы және маркетинг кафедрасының доценті, Қ.Жұбанов атындағы Ақтөбе өңірлік университеті, Ақтөбе, Қазақстан

**E-mail:** [utegen\\_z\\_78@mail.ru](mailto:utegen_z_78@mail.ru), <https://orcid.org/0000-0001-6604-4135>

**Аңдатпа.** Мұнай-газ секторы-экономиканың маңызды құрылымдық құрамдас бөлігі, еңбек өнімділігінің, өндіргіш күштер мен ел халқының тыныс-тіршілігінің өсуінің негізгі факторларының бірі. Ол экономиканың барлық салалары мен халықты табиғи газбен, моторлы отынның, жанар-жағармай материалдарының кең ассортиментімен, мұнай химиясы үшін шикізатпен, қазандық-пеш отынымен және басқа да мұнай өнімдерімен қамтамасыз етеді. Мұнай-газ кешені елдің және оның жекелеген өңірлерінің әлеуметтік-экономикалық дамуына шешуші әсер етеді, шын мәнінде, мемлекеттің бүкіл экономикасы үшін донор болып табылады, экономиканың басқа салаларының дамуына ықпал етеді. Мұнай-газ кешені кәсіпорындарының жұмысымен өңірлер мен бүкіл мемлекет ауқымындағы аса маңызды әлеуметтік бағдарламаларды іске асыру байланысты, ол экономиканы дамытудың негізі болып табылады және көбінесе елдің экономикалық тәуелсіздігін айқындайды. Қазіргі өнеркәсіптің шикізат базасын мұнай мен газсыз елестету мүмкін емес. Мұнай мен газ тек үнемді энергетикалық отын ғана емес, сонымен қатар мұнай-химия өнеркәсібі үшін таптырмайтын шикізат болып табылады.

Мақалада мұнай-газ кешенінің маңыздылығы және мұнай-газ кәсіпорындарындағы шығындарды тиімді басқару қажеттілігі қарастырылады. Шығындарды басқарудың кешенді тәсілінің қажеттілігі негізделген. Мұнай-газ кешені кәсіпорындары үшін шығындарды басқару жүйесін жетілдіру бағыттары тұжырымдалған, мұнай мен газдың өзіндік құнын калькуляциялауды қарастырған.

**Түйін сөздер:** мұнай-газ саласы, шығындар, өнімнің өзіндік құны, калькуляция бірлігі, мұнай, газ, үрдіспе-үрдіс әдісі

## ПОРЯДОК РАСЧЕТА СЕБЕСТОИМОСТИ ПРОДУКЦИИ ПО ЭКОНОМИЧЕСКИМ ЭЛЕМЕНТАМ И СТАТЬЯМ КАЛЬКУЛЯЦИИ НА БАЗЕ НЕФТЕГАЗОВОГО ПРЕДПРИЯТИЯ

ПАНКОВ Д.А.<sup>1</sup> , ИМАНБАЕВА З.О.<sup>2\*</sup> 

**Панков Дмитрий Алексеевич**<sup>1</sup> — доктор экономических наук, профессор, заведующий кафедрой бухгалтерского учета, анализа и аудита в отраслях народного хозяйства, Беларусский государственный экономический университет, г. Минск, Республика Беларусь

**E-mail:** [d.pankov@lund-univer.eu](mailto:d.pankov@lund-univer.eu), <https://orcid.org/0000-0003-2898-7225>

**\*Иманбаева Зауреш Отегенқызы**<sup>2</sup> — кандидат экономических наук, ассоциированный профессор, доцент кафедры государственного управления, финансов и маркетинга, Актыбинский региональный университет имени К. Жубанова, г. Ақтөбе, Казахстан,

**E-mail:** [utegen\\_z\\_78@mail.ru](mailto:utegen_z_78@mail.ru), <https://orcid.org/0000-0001-6604-4135>

**Аннотация.** Нефтегазовый сектор-важнейшая структурная составляющая экономики, один из основных факторов роста производительности труда, производительных сил и жизнедеятельности населения страны. Он обеспечивает все отрасли экономики и население природным газом, широким ассортиментом моторного топлива, горюче-смазочных материалов, сырьем для нефтехимии, котло-печным топливом и другими нефтепродуктами. Нефтегазовый комплекс оказывает решающее влияние на социально-экономическое развитие страны и

отдельных ее регионов, фактически является донором для всей экономики государства, способствует развитию других отраслей экономики. С работой предприятий нефтегазового комплекса связана реализация важнейших социальных программ в масштабах регионов и всего государства, которая является основой развития экономики и во многом определяет экономическую независимость страны сырьевую базу современной промышленности невозможно представить без нефти и газа. Нефть и газ являются не только экономичным энергетическим топливом, но и незаменимым сырьем для нефтехимической промышленности.

В статье рассматривается важность нефтегазового комплекса и необходимость эффективного управления затратами на нефтегазовых предприятиях. Обоснована необходимость комплексного подхода к управлению затратами. Сформулированы направления совершенствования системы управления затратами для предприятий нефтегазового комплекса, предусмотрено калькулирование себестоимости нефти и газа.

**Ключевые слова:** нефтегазовая отрасль, затраты, себестоимость продукции, единица калькуляции, нефть, газ, попроцесный метод