ON THE ISSUE OF DRAWING UP THE ENERGY BALANCE OF A FAT-AND-OIL ENTERPRISE

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Abstract. The article deals with the issue of drawing up the energy balance of a fat and oil enterprise. The results of experimental studies are presented. The energy balance of the average consumed power in kWh and in MJ was compiled in order to obtain a generalized energy balance at the company "EUROSINAR" LLC. A nomenclature is proposed that fully covers production processes and corresponds to the currently accepted indicators of accounting and control in a market economy, and a nomogram for determining the specific consumption of heat energy per ton of seeds and oils for production in general.

It has been substantiated that one of the ways to solve the problem of improving the reliability and accuracy of forecasts of indicators of the energy balance of an industrial enterprise is their forecasting, taking into account the relationship with other indicators characterizing the production process. When implementing this method, the foundations of the theory of probability and mathematical statistics were used.

Introduction

In the design of energy supply and in rationalization work to save fuel and energy at oil extracting enterprises, it often happens that when assessing the effectiveness of planned measures to save fuel and energy, they proceed from an analysis of private energy balances and do not take into account that in the combined production and use of various types of energy (electric and thermal) measure, which gives savings on losses or consumption of one or another type of energy, ultimately can lead not to savings, but to overspending of the primary energy resource (fuel). The above can be avoided if the assessment of energy use and the design of measures to save fuel and energy is based not only on the independent compilation and analysis of synthesized heat and electrical balances of the enterprise, but also on the compilation and analysis of generalized energy balances. The basis for drawing up the energy balance of an enterprise should be based on a comprehensive, comprehensive survey of an operating industrial enterprise, allowing to obtain reliable energy and technological characteristics of equipment, to determine the main sources of losses and reserves for a possible increase in the efficiency of the energy sector. In this survey, accounting and reporting data should be used in a comprehensive manner together with equipment test data [1,2]. (2- article Jalilov R)

The following data can be used from the existing statistical reporting to compile the energy balance of the enterprise:

- a) total consumption of equivalent fuel, heat and electricity for the production of main types of products and for the enterprise as a whole;
- b) types of fuel and energy resources used at enterprises, their quantity and distribution according to strengthened groups of technological processes;
- c) the number of manufactured products with the allocation of the most energy-intensive types;
- d) planned and actual specific consumption of fuel, heat and electricity for the production of types of products;
- e) the electric balance of an industrial enterprise by enlarged groups of consumers and the composition of power equipment;

The indicators of existing reporting do not allow identifying energy losses at the enterprise, which can only be obtained by compiling, on the basis of full or partial tests (measurements), individual and group balances for all installations of conversion, distribution and consumption of energy of all types. The generalized energy balance must be built in a synthesized form, so that it not only shows the total consumption and use of energy consumed by the enterprise in all its types and energy carriers, but also takes into account the losses in the production and transmission of energy of each type both inside the enterprise and outside it.

To do this, all the components of the generalized energy balance must be expressed in one unit of measurement and refer all the energy received from the outside to the primary energy resource from which it is received.

It is most convenient to compose a generalized energy balance in units of heat in joules (J), since the universal unit of work of any type of energy, as well as the amount of heat in the SI system according to GOST 18675-2012, is Joule (J).

The basis for the compilation of generalized energy balances is the private synthesized balances of heat and electricity for the enterprise. At the same time, the amount of electricity is converted into heat at the equivalent of $1 \text{ kW} \cdot \text{h} = 860 \text{ kcal} = 3.6 \text{ MJ}$.

All sorts of qualitative and quantitative changes in the plant's power engineering find their generalized expression in the change in the value of the energy consumption coefficient and the specific consumption of reduced heat per unit of production. Therefore, it is important to periodically compare with each other the actual generalized balances of the enterprise over the years in order to analyze the qualitative and quantitative changes in the energy of the enterprise.

For a generalized assessment of the reserves of fuel and energy saving and taking them into account when developing specific plans for organizational and

technical measures to save fuel and energy at an enterprise, it is also important to draw up normal generalized balances and compare actual balances with them [1,2].

Table 1 shows the electrical balance of the average power consumption, compiled using the example of the Chard-Zhou oil extraction plant, converted into heat, which is necessary for drawing up a generalized energy balance of the enterprise. The obtained results are compared with the calculated ones carried out in LLC "EUROSAR", the heat balance of these two enterprises is compared and practical recommendations are given. [3].

The electrical balance of the average power consumption, obtained as a result of a series of measurements and mathematical processing of static data with an average seed productivity of 30 t/h , shows that more than 58% of the total power is consumed by the preparatory shop, consisting of a hulling-separator, rolling and prepressing department.

The extraction shop with the meal storage consumes more than 25%, and the refining shop 2.0%. The remaining 14% of the capacity is spent on auxiliary needs of the enterprise and losses and networks and transformers.

Table 1. Electrical balance of average power consumption in the example of Chard-Zhou oil extraction plant

Name workshops	Average power consumption		
	kW	MJ	%
Preparatory workshop	1596	5745,6	58,4
Including:			
a) hulling and separating department	560,19	2016,68	20,5
b) rolling department	340,26	1224,94	12,45
B) forepress compartment	695,55	2503,98	25,45
Extraction shop and meal storage (2 extractors and 2 lines of pneumatic conveyor of meal)	703,6	2533	25,74
Refining workshop	54,6	196,56	2
General plant auxiliary needs	262,9	946,4	9,62
Losses in networks and transformers	115,9	417,24	4,24
Oil extraction plant total	2733	9838,8	100

Compilation and analysis of energy balances of industrial facilities is one of the important elements in the complex of works related to solving problems of fuel and energy saving in industry. The compilation and analysis of energy balances is aimed at solving the following main tasks:

- assessment of the actual state and efficiency of energy use at the enterprise, identification of the causes

of occurrence and determination of the volume of losses of energy resources and energy carriers;

- identification and assessment of reserves of fuel and energy savings and development of an action plan aimed at reducing their losses;

- improvement of the operating modes of technological and power equipment;

- determination of the rational size of energy consumption in production processes and installations;

- the establishment of requirements for the organization and improvement of the system of accounting and control of the consumption of energy resources and energy carriers;

- optimization of the structure of the energy balance of the enterprise by choosing the optimal directions, methods and sizes of using the supplied and secondary energy resources;

- improvement of internal production cost accounting and incentive systems for fuel and energy savings.

The analysis of energy balances consists in a qualitative and quantitative assessment of the state of the energy economy and energy use and is carried out in the following directions:

- study of the structure of the receipt and consumption of energy resources and energy carriers at the enterprise;

- determination of indicators of energy efficiency; – Calculation of generalized indicators of the state and development of the energy economy of the enterprise;

- obtaining initial information for the formulation and solution of problems of optimization of the structure of the energy balance of the enterprise.

The calculation of the energy balances of the SES of the enterprise begins with the determination of the technological power consumption of the technological electrical equipment (TEE). Here, the initial data will be the readings of the meters installed at the settlement unit for the consumed thermal energy (SNTE).

As a basis for the calculation, we take the energy characteristics, which represent the dependence of the energy consumption indicators on performance.

The calculation takes into account the averaged statistical data on the readings of heat consumption meters (TE) and production output for the past period (year, month), as well as data on measurements of the consumed energy of objects that do not have heat energy metering [2,3].

Determination of the energy balance of the enterprise

The calculation includes the development of a production power balance and methods for calculating the absolute and specific power consumption.

The volume of seeds processed by the enterprise for the planned month in April (29 days) - PM = 3325.605 tons (average daily (per day) volume Ps = 114.676 tons). Average oil recovery rate 18.7% | (Kv = 0.187).

Average daily output:

Refined oil - 21.444 tons ($114.67 \times 18.7\% = 21.44$).

Press oil - 16.627 tons ($114.67 \times 14.5\% = 16.63$)

Oil extraction - 5.16 t ($114.67 \times 4.5\% = 5.160$)

Husk - 35.55 tons ($114.67 \times 31\% = 35.55$).

Meal (cake) - 51.6 t ($114.67 \times 45\% = 51.601$). Table 2 below shows the average daily volume of products manufactured at the enterprise for the month of April.

Figure 1 shows a diagram of the average daily output of an enterprise.

Table 2. The volume of products manufactured at the enterprise in April

№	Produced product	Issue volume, t
1	Refined oil	21,444
2	Forpress oil	16,627
3	Extraction oil	5,16
4	Peel	35,55
5	oilcake	51,6

Figure: 1. Average daily output of the enterprise.

Calculation of the absolute and specific electricity consumption for heat generation.

With an average daily heat production in the amount of $P_{t.e.} = 99.8$ Gcal. (24 hours · 489 m³ / hour · 8500 kcal / m³ = 99.756 Gcal (4.156 Gcal / hour)), at $W_o = 8.5$ kWh, applying formula (14) [4], we determine the partial specific consumption of electricity for heat energy:

$$\tau = \frac{1140 \text{ kW.h} - 8,5 \text{ kW.h}}{99,8 \text{ Gcal}} = 11,33 \text{ kW.h / Gcal}$$

Specific electricity consumption for heat generation in accordance with formula (12) [4].

Will be:

$$\alpha = \frac{8,5}{99,8} + 11,33 = 11,41 \text{ kW.h / Gcal}$$

The predicted value of the power consumption of the boiler house, depending on the volume of heat production, in accordance with the formula (13) [4].

определяется следующим выражением:

$$W_{te} = 8,5 + 11,33 \cdot P_{te}, \frac{\text{kW.h}}{\text{Day}}$$

Determine the share of other electricity costs of the enterprise attributable to the production of heat in the boiler house:

$$\gamma = \frac{W_k}{W_{bef}} = \frac{1140 \text{ kW.h / Day}}{7747,033 \text{ kW.h / Day}} = 0,147$$

Electricity consumption for heat energy generation at the enterprise, taking into account general plant costs and losses, will be:

$W_{sub} = 1140 + 0.147 \cdot 76 + 0.147 \cdot 83.2 = 1163.402$ kWh/day The general production rate of electricity consumption for heat generation (e.e.) will be:

$$e_{t.e.} = \frac{W_{sub}}{P_{t.e.}} = \frac{1163,402 \text{ kW.h}}{99,8 \text{ Gcal}} = 11,65 \text{ kW.h / Gcal.}$$

Determine the heat consumption for the production of 5, 64 kg of steam:

$$Q_p = M_p \cdot Q_o = 3,371 \cdot 2089 = 7040 \text{ kJ}$$

Calculation of the specific consumption of heat energy for the production of main and by-products

Calculation of steam consumption for the production of vegetable oil from cotton seeds.

The calculation is carried out when processing 200 tons of cotton seeds per day, to obtain vegetable oil by the forepress extraction method.

Determine the amount of mint obtained from 200 tons of cotton seeds. Cottonseed consists of 40% rind (husk) and 60% mint.

$$G_m = 200 \cdot 0.6 = 120 \text{ t}$$

After grinding, 15% of the husk is added to the mint after grinding. Determine the amount of mint after adding the husk.

$$G_m = 120 \cdot 0.15 = 18 \text{ t}$$

$$G_m = 120 + 18 = 138 \text{ t}$$

Determine hourly performance

$$W_1 = 138 \cdot 1000 / 24 = 5750 \text{ kg / h}$$

Steam consumption in the process of humidification and frying.

The cotton seed is heated and humidified before frying. This process is carried out on steaming and dampening screws. Mint in the steaming - humidifying augers is heated from $t_1 = 200^\circ\text{C}$ to $t_2 = 650^\circ\text{C}$.

$$D = \frac{G \cdot C \cdot (t_2 - t_1) + \mu}{r};$$

Where:

G-amount of cotton mint supplied by the steaming - humidifying screw kg / h;

C- specific heat capacity of cotton seed, kJ / kg · K

$C = 0.42$ kcal / kg · deg

r-specific heat of vaporization

$r = 2133.8$ kJ / kg

$\mu = 1.05$ heat loss,

$$D = \frac{5750 \cdot 1.76(65 - 20) \cdot 1.05}{2133,8} = 224,093 \text{ kg / hour:}$$

Daily steam consumption for steaming and dampening screws

$$D_{day} = 224.093 \cdot 24 = 5378 \text{ kg} = 5.38 \text{ t}$$

Steam consumption for steaming - dampening screws to obtain 1 kg of oil.

$$D_{uv} = 5380 / 37800 = 0.14 \text{ kg}$$

Heat consumption for the formation of 1 kg of solid steam during the frying process. $Q = 2133.8$ kJ

Steam consumption during roasting

Moisture mass in mint

$$G = W_1 \cdot \omega = 5750 \cdot 0.12 = 690 \text{ kg}$$

Where; W_1 hour productivity.

ω - moisture content of the meat before frying

The amount of dry roasting pulp

$$G_{k.m} = G - G_m = 5750 - 690 = 5060 \text{ kg}$$

Air consumption for generating steam during frying.

$$L = P_B \cdot R_{\Pi} / P_{\Pi} \cdot R_B \cdot W = 0.75 \cdot 47.1 / 0.25 \cdot 29.27 \cdot 367 = 35,325 / 7,3175 \cdot 367 = 1772 \text{ kg}$$

where G_m is the amount of mint;

G is the mass of moisture in the mint;

P_w - partial air pressure at the same temperature is $1 - 0.25 = 0.75$ atm. ($0.75 \cdot 105 \text{ n / m}^2$);

R_{Π} -47.1 gas constant for water vapor;

R_B -29.27 gas constant for air

P_p -partial vapor pressure at $t_{av} = 650^\circ\text{C}$ ($25 + 105/2$) is 0.25 atm ($0.25 \cdot 105 \text{ n / m}^2$)

The arrival of heat

Heat supplied with mint:

a) with dry fatty substance of pulp

$$Q_1 = G_{d.w} \cdot s_{s.w} \cdot t_1 = 5060 \cdot 0.42 \cdot 20 = 42\,504 \text{ kcal}$$

where; $G_{d.w}$ - the amount of dry fatty substance;

$s_{s.v}$ - heat capacity of dry fatty substance, 0.42 kcal / kg $^\circ\text{C}$;

t_1 is the temperature of the mint.

b) with moisture in the pulp

$$Q_2 = G_B \cdot s_v \cdot t_1 = 690 \cdot 1 \cdot 20 = 13\,800 \text{ kcal}$$

Where; G_w is the mass of moisture in the mint;

sv - heat capacity of water, 0.42 kcal / kg0C;
t1 is the temperature of the mint.
Heat supplied with air
 $Q3 = L \cdot sv \cdot t1 = 1772 \cdot 0.24 \cdot 20 = 8505.6 \text{ kcal}$
Heat coming with dead steam
 $Q4 = ip \cdot P = 656P$
Where; ip-enthalpy of steam.
The total amount of heat entering the brazier
 $Qv = Q1 + Q2 + Q3 + Q4 = 64810 + 656P$

Heat consumption in the roasting

Heat carried away by the finished pulp:

a) with dry fatty substance

$$Q5 = Gs.wss.vt2 = 5060 \cdot 0.42 \cdot 105 = 223 \text{ 146 kcal}$$

Where; t2-temperature of the pulp

2. With moisture

$$Q6 = G'w \cdot ss.wt2 = 323 \cdot 1 \cdot 105 = 33 \text{ 915 kcal}$$

$$G'v = Gm - W = 690 - 367 = 323$$

3. Heat carried away by the exhaust air

$$Q7 = Q3 = Lwt\dot{y}rt = 1772 \cdot 0.24 \cdot 65 = 27643 \text{ kcal}$$

Heat leaving with dead steam condensate

$$Q8 = qkP = 152P$$

Heat carried away by evaporating moisture

$$Q9 = ipW = 625 \cdot 367 = 229 \text{ 375 kcal}$$

The heat loss is assumed to be 2.0% of Q4

$$Q10 = 0.02Q4 = 0.02 \cdot 656P = 13.1P \text{ kcal.}$$

The total amount of heat released in the brazier

$$Qout = Q5 + Q6 + Q7 + Q8 + Q9 + Q10 = 223146 + 33915 + 27643 + 152P + 229 \text{ 375} + 13.1P = 514079 + 165.1P$$

Where; Q is the amount of heat;

Gw. - the amount of dry fatty substance;

ss.v - heat capacity of dry fatty substance;

t is the temperature of the meat;

qk - heat content of condensate;

ip - heat content of steam.

Comparing income and consumption in the heat balance

$$Q1 + Q2 + Q3 + Q4 = Q5 + Q6 + Q7 + Q8 + Q9 + Q10 = 64810 + 656P = 514079 + 165.1P$$

Solving the previous system of equations, we find the steam consumption

$$449269 = 490.9R$$

$$P = 915 \text{ kg}$$

Daily steam consumption in the brazier

$$D\pi = 915 \cdot 24 = 21960 \text{ kg} = 21.96 \text{ t}$$

From the previous data, we find the steam consumption per kg of oil for the frying process.

$$Dzh = 21.96 \cdot 1 / 37.8 = 0.58 \text{ t}$$

1 kg of oil mass consumes 0.58 kg of steam

In the process of moistening and frying, to obtain 1 kg of oil, steam is consumed in the following amount:

$$\Sigma D = Duv + Dzh = 0.14 + 0.58 = 0.72 \text{ kg}$$

Heat consumption for the formation of 1 kg of solid steam during the roasting process.

When frying, steam is used with a pressure of 4 atm. At a steam temperature of 1430C, steam enthalpy ip =

2738.5 kJ / kg, condensate enthalpy ik = 604.7 kJ / kg, heat consumption is determined by the following formula:

$$Q = D (ip - ik) = 1 (2738.5 - 604.7) = 2133.8 \text{ kJ}$$

Determine the heat consumption to obtain 0.72 kg of steam during the frying process

$$Q = 0.72 \cdot 2133.8 = 1536.336 \text{ kJ.}$$

Determine the steam consumption for the formation of 1536.336 kJ of heat.

Determination of steam consumption in the process of vegetable oil refining.

Heating with dead steam before neutralization from tl.n = 200C to tl.h. = 600C with a specific heat capacity c = 1.82 kJ / (kg · K)

$$Q1 = G \cdot c \cdot (tzh.k - tzh.n.) \cdot \mu = 5000 \cdot 1.82 \cdot (60 - 20) \cdot 1.05 = 382 \text{ 200 kcal}$$

We determine the specific consumption of working steam.

$$D1 = \frac{Q1}{i} = \frac{382200}{1959} = 195 \text{ kg}$$

Oil washing and drying apparatus.

Heating with dead steam before washing 5000 kg / h from tn = 500C to tc = 950C.

$$Q2 = G \cdot c \cdot (tzh.k - tzh.n.) \cdot \mu = 5000 \cdot 1.90 \cdot (95 - 50) \cdot 1.05 = 448 \text{ 875 kcal}$$

We determine the specific consumption of working steam.

$$D2 = \frac{Q2}{i} = \frac{448875}{1959} = 229 \text{ кг}$$

Drying the oil to reduce its residual moisture content from 0.2 to 0.1% with the enthalpy of the secondary vapor iw = 2677 kJ / (kg · K).

$$Q3 = G \cdot iw \cdot (x1 - x2) \cdot \mu = 5000 \cdot 2677 \cdot (0.2 - 0.1) \cdot 1.05 = 2810849.895 \text{ kJ.}$$

Where; x1-moisture content of unrefined oil

x2-moisture of refined dried oil

The amount of specific consumption of working steam during drying

$$D3 = Q3 / ip = 2810849.895 / 1959 = 1435 \text{ kg}$$

Heating the oil in the bleaching apparatus with deaf steam from tn = 200c to tc = 650c.

$$Q = G \cdot C \cdot (tk - th) \cdot \mu.$$

Where; G - the amount of bleached oil, kg.

C- specific heat capacity of oil c = 2.063 kJ / kg · k.
μ-1.05 heat loss.

$$Q = 5000 \cdot 2.06 \cdot (95 - 20) \cdot 1.05 = 811125 \text{ kJ.}$$

Dead steam consumption

$$D4 =$$

Steam consumption per 1 kg of oil.

$$5000 - 414 \text{ kg}$$

$$1 \text{ kg} - D$$

$$D4 = \frac{414}{5000} = 0.08 \text{ кг}$$

Total steam consumption in the refining process

$$D_{ob} = D1 + D2 + D3 + D4 = 195 + 229 + 1435 + 414 = 2273 \text{ kg}$$

From the previous data we find the steam consumption per kg of oil for the refining process

$$D = 2273 \cdot 1/5000 = 0.45 \text{ kg}$$

Heat consumption for the formation of 1 kg of dead steam during the refining process.

When refining, steam is used with a pressure of 3 atmospheres, at a steam temperature (i_p - i_k), enthalpy of steam $i_p = 2725.2 \text{ kJ / kg}$, enthalpy of condensate $i_k = 561.4 \text{ kJ / kg}$, heat consumption for the formation of 1 kg of steam is determined by the following formula

$$Q = D (i_p - i_k) = 1 (2725.2 - 561.4) = 2163.4 \text{ kJ}$$

Determine the heat consumption to obtain 0.45 kg of steam in the refining process

$$Q = 0.45 \cdot 2163.4 = 973.53 \text{ kJ}$$

Determine the steam consumption for the formation of 973.53 kJ of heat

Calculation of steam consumption in the process of deodorization of oils

Diagram of a batch deodorizer

Steam consumption is carried out in a batch deodorizer. Heating the oil with dead steam to the deodorization temperature from $t_H = 250^\circ\text{C}$ to $t_K = 130^\circ\text{C}$,

$$Q1 = G \cdot c (t_K - t_H) \mu$$

Where; G-mass of deodorized oil, kg

C-specific heat capacity of oil $c = 2.32 \text{ kJ / kg} \cdot \text{K}$

μ -1.05 heat loss.

$$Q1 = G \cdot c (t_K - t_H) \mu = 5000 \cdot 2.32 (130 - 25) \cdot 1.05 = 1278900 \text{ kJ}$$

Consumption of steam with a pressure of 2.2 MPa with its useful enthalpy $i = 2799.1 \text{ kJ / kg}$

$$D1 = Q1 / i = 1 \cdot 1278900 / 2799.1 = 457 \text{ kg}$$

Steam consumption for 1 kg of oil

$$D1 = 457/5000 = 0.092 \text{ kg}$$

Deodorization is given at a temperature $t_H = 130^\circ\text{C}$, and $t_K = 200^\circ\text{C}$.

The heat consumption for heating deodorization is determined by the following formula. $Q2 = G \cdot c \cdot (t_2 - t_1) \mu = 5000 \cdot 2.37 \cdot (200 - 130) \cdot 1.05 = 870 \text{ 975 kJ}$

Steam consumption is determined

$$\frac{Q1}{D2} = \frac{870 \text{ 975}}{1690} =$$

$$D2 = \frac{1690}{515} = 515 \text{ kg}$$

Live steam consumption in the deodorization process is determined by the following formula.

$$D3 = (0.115 \dots 0.145) \cdot G = 0.125 \cdot 5000 = 625 \text{ kg}$$

Determine the total steam consumption in the deodorization process.

$$D_{total} = D1 + D2 + D3 = 457 + 515 + 625 = 1597 \text{ kg}$$

From the previous data, we find the steam consumption per kg of oil for the process

$$D = 1597 \cdot 1/5000 = 0.32 \text{ kg}$$

Heat consumption on the basis of 1 kg of dead steam during oil deodorization. For deodorization, steam is used with a pressure of 2.2 MPa, at a steam temperature $t_p = 217^\circ\text{C}$, steam enthalpy $i_p = 2799.1 \text{ kJ / kg}$, condensate enthalpy $i_c = 930.9 \text{ kJ / kg}$, heat consumption for formation of 1 kg of steam is determined by the following formula ...

$$Q = D (i_p - i_c) = 1 (2799.1 - 930.9) = 1868.2 \text{ kJ}$$

Determine the heat consumption to obtain 0.32 kg of steam in the process of deodorization

$$Q = 0.32 \cdot 1868.2 = 597.82 \text{ kJ}$$

Determine the steam consumption for the formation of 597.82 kJ of heat

Calculation of steam consumption in the extraction process.

Raw material balance

Table -3.

№	Indicators	Exit	
		%	t / day
1.	Forpress oil outlet P2	14,63	29,26
2.	P3 extraction oil yield	4,36	8,72
3.	Meal exit III	46,32	92,64
4.	Hull yield L5	31,73	63,46
5.	Removal of empty seeds T2	0,55	1,1
6.	Removal of mineral and organic litter C2	0,2	0,4
7.	Moisture loss P5	2,21	4,42
Total		100	200

Oil balance Table -4

№	Indicators	Exit	
		%	t / day
1.	Oil in shifts M0	20,00	40,0
2.	Forpress oil outlet P2	14,63	29,26
3.	P3 extraction oil yield	4,36	8,72
4	Oil loss: in meal P1	0,51	1,02
	in husk P2	0,48	0,96
	in empty seeds	0,02	0,4
	Total	100	200

Table -5.

Heat used process	The amount of processed product per day, t	The amount of processed product in hours	The amount of steam consumed per day, t	The amount of steam consumed in hours, kg	The amount of steam consumed per 1 kg of finished product	The amount of heat for the formation of 1 kg of steam, kJ	Gas quantity for 1 ton of oil, m3
Steam humidification auger and braziers	138	5750	27,34	1139 кг	0,72 кг	2133,8	
In refining processes	37,9	1579	17,229	711 кг	0,45 кг	2163	
In the process of deodorization	34,1	1421	10,91	455 кг	0,32 кг	1868	
During the extraction process			16,405	683 кг	1,1881 кг	2163	
Total			71,88 t	2988 kg	3,371 kg	2089	245

Figure 2 shows a diagram of the energy balance of the enterprise.

Fig.2 Energy balance of the company "EUROSNA" LLC.

Conclusions

1. The daily production volume of "EUROSNA" LLC was investigated. The balance of consumed heat energy for manufactured products has been calculated.
2. According to the indicators of the balance of heat energy of "EUROSNA" LLC, the calculation of the absolute and specific consumption of electricity for the generation of heat energy was performed, on the basis of which the diagram was built.
3. The results obtained are compared with the heat balance of the Chard-Zhou oil extraction plant, and it is recommended to apply this calculation method to other similar enterprises.

References

1. Energy Consumption Forecasting for Power Supply Companies// International Journal of Energy Economics and Policy. 2019, 9(1), 1-6.
2. Jalilov R.B. Research and development of methods for rationalizing electricity consumption modes in production of refined cottonseed oil. Dissertation of candidate. - Moscow: 1992, p. 258.
3. Zhalilov R.B., Jalilov M.Kh. To the question of compiling the energy balance of cotton-oil plants // Tashkent Order of Friendship of Peoples Polytechnic Institute named after Abu Raikhan Beruni. Problems of energy saving in heat engineering processes, Collection of scientific papers, Tash. 1990, p. 70-73
4. ENERGY SURVEY REPORT FOR LLC "EUROSNA" BUKHARA-2018
5. Baratov N.A., Dzevensky A.Ya., Ibragimov K.Kh., Khashimov F.A., Khamidov S.I. Methods of forecasting and rationing of electric and thermal energy for the products of enterprises of the fat and oil industry. – Tashkent, Fan, 1999. –83 p.
6. I U Rakhmonov, L A Nematov, N N Niyozov, K M Reymov and T M Yuldoshev (2020) Power consumption management from the positions of the general system theory. Journal of Physics: Conference Series doi:10.1088/1742-6596/1515/2/022054.
7. I U Rakhmonov, A N Tovbaev, L A Nematov and T Sh Alibekova (2020) Development of forecasted values of specific norms for the issues of produced products in industrial enterprises. Journal of Physics: Conference Series doi:10.1088/1742-6596/1515/2/022050.