MARKETS AND
COMPETITION

MIKAYEL MELKUMYAN
Head of the Chair of Microeconomics of Armenian State University of Economics, Doctor of Economics, Professor
https://orcid.org/0000-0003-1048-4056

SUREN PARSYAN
PhD in Economics, Associate Professor at Armenian State University of Economics
https://orcid.org/0000-0003-0561-3052

TAGUHI BARSEGHYAN
PhD in Economics, Associate Professor of Armenian State University of Economics
https://orcid.org/0000-0002-4390-3133

ZARUHI MELKUMYAN
PhD in Economics, Associate Professor at Armenian State University of Economics
https://orcid.org/0000-0002-0473-1965

MARIAM TITIZYAN
Applicant at Armenian State University of Economics
https://orcid.org/0000-0002-9229-5170

AMALYA BAHARYAN
PhD student at Armenian State University of Economics
https://orcid.org/0000-0002-6598-5627

APPLICATION OF REACTIVE POWER TARIFFS AS A WAY OF ENERGY SAVING

The paper analyzes the current state of the RA electricity market and presents the legislative regulation of the sector, as well as the main provisions of the tariff policy in the RA electricity system. Most of the reactive energy producing and supplying power plants do not keep separate accounting of costs, which would allow for accurately calculating the amounts of the consumption fee or tariff for reactive energy. Therefore, it is necessary to implement corresponding changes in the legislative field regulating the energy sector,

which would settle the issues of classification, rationing, accounting, and reporting of costs incurred on the production of reactive energy.

Keywords: *electricity market, state regulation, differentiated tariff, tariff margin, generating stations, active electricity, reactive electricity*

JEL: P28, Q40

DOI: 10.52174/1829-0280_2021_5_81

Introduction. To motivate industrtial consumers, the retention of optimal coefficient of reactive power was introduced still in the 30s during the intensive industrialization period. In other words, by reducing the amount of reactive power, it was possible to save on the intersection of voltages and the power of transformers.

In addition to active power generated in power plants, reactive power is used to transmit electricity. Power consumers use active and reactive power at the same time. In electricity, the ratio of reactive to active power is known as the reactive power factor.

Currently, most of the reactive energy producing and supplying power plants do not keep separate accounting of costs, which would allow to accurately calculate the amounts of the consumption fee or tariff for reactive energy. Therefore, it is necessary to implement corresponding changes in the legislative field regulating the energy sector, which would settle the issues of classification, rationing, accounting, and reporting of costs incurred on the production of reactive energy.

At the same time, a new methodology for calculating the reactive electricity tariff has been recommended.

Literature review. The theoretical and methodological basis for solving the tasks set in the study are the main provisions of classical and modern theories of economics, the works of domestic and foreign researchers, legislative regulation of the sphere, and by-laws. Research has been carried out in connection with reactive electricity in the Republic of Armenia, but it was considered from the point of view of generation and consumption of electricity, mainly in connection with the latest work of a technical nature. In particular, Associate Professor of Technical Sciences Henry Abrahamovich Balabanyan in his works studied reactive electricity-energy phenomena in alternating current circuits, including the calculation of sinusoidal current circuits. However, to establish a charge for electricity consumption, it is necessary to consider reactive energy from a different point of view. In particular, within the framework of the study, we considered reactive electricity from the point of view of economics. Furthermore, we found it necessary to study the costs of producing reactive electricity, calculating losses at the stages of transporting reactive electricity, and the use by consumers of tools for converting reactive energy. Thus, to study the problems we mentioned, from the information we received, we tried to filter out the formulas and approaches we needed.

In terms of calculating reactive electricity, we have assessed the importance of starting with the norms applied in the USSR and ending with their application today. The studies on the calculation and conversion of reactive electricity were

carried out by specialists in the electric power industry of the Russian Federation and Ukraine. In connection with the economical representation of reactive energy, which found a place in the present study, the work of the Russian thermophysicist Evgeny Viktorovich Ametistov, as well as the work of B.A. Konstantinov and G.E. served as the main source of research. The work "compensation of reactive energy" by Zaitsev was published in 1976, and the resolutions used in the study are based on the analysis of Arbuzov, currently used in Ukraine.

Research Methodology. A wide range of works of various foreign authors related to reactive energy served as a scientific base for the present study. Unfortunately, in the Republic of Armenia the scientific works in connection with the latter have no economic content, on the contrary, they mostly reflect the technical characteristics associated with the emergence and losses of reactive electric energy. The basis for the research was mainly data provided by the participants of the electricity market of the Republic of Armenia, as well as the data provided by the state, including references in legal acts adopted in relation to active and reactive energy. Therefore, to assess the feasibility of calculating the supply and demand of reactive electricity, as well as of establishing service fees, the researchers used scientific research methods, empirical research methods of scientific cognition-comparison, as a result of which reactive electricity was studied through a number of calculation formulas. The research also used a measurement method, in particular, the volumes of consumption of reactive and active electricity within the framework of an electric motor installed in the refrigerator. In the research, an analysis method was also used, with the help of which the capabilities of reactive power producers in the electricity market of the Republic of Armenia and the dynamics of peak reactive power values were studied.

Thus, using the above methods, we had the opportunity to present proposals in the research to change the state's policy on the electricity market, using the method of induction from particular cases and facts, we drew general conclusions, including identifying existing legislative gaps and presented proposals to solve the problem.

The results of the research carried out within the framework of the study have both economic, informational, and applicative significance, since at present it is important for the Commission for the Regulation of Public Services and the Ministry of Territorial Administration and Infrastructures of the Republic of Armenia to implement legislative changes regarding the calculation of reactive electricity and the establishment of regulations related to administration.

Analysis. **Active electricity is** fully transformable energy that enters the electricity supply chain**.** The transformation can take place in the form of heat or other types of energy, but the content remains the same: the received electricity does not go back to the source**.**

Reactive electricity is the part of the total input power that is not used for useful work**.** Currently, no separate calculation of the reactive energy tariff is

conducted in the electricity supply system of Armenia; in terms of this separate components are included in the losses.

The main consumers of reactive energy in power supply systems are transformers, overhead power lines, asynchronous motors, induction electric furnaces, welding units, etc.

Asynchronous motors are the main consumers of reactive power in industrial enterprises. They account for 65-70 percent of the reactive power consumed by the enterprise. About 20-25 percent of reactive power consumption is accounted for utility transformers and about 10 percent - for other receivers and transmission lines.[1]

Let us discuss the consumers of reactive power in the household. In particular, there are more and more devices and equipment that "allow to save" electrical energy at home by compensating for the reactive component of the network. Sales consultants express interesting ideas about those devices, their cost-efficiency, low cost, and the possibility of significant savings on electricity bills. Contrary to the stories of sales consultants, the reality is completely different. This is primarily due to the fact that energy companies do not take into account the reactive power consumed by residential consumers. In other words, not always do the countries calculate the reactive power and demand for it. Besides, nowadays, very powerful devices are very often used in everyday life: refrigerators, air conditioners, stoves, etc., which also consume a large amount of reactive power that can be reduced with the help of a compensator. Another potential disadvantage is quite a large frequency of load changes (off - on), since very often cos φ is not indicated in the instructions of household appliances, which makes it very difficult to calculate the reactive component. Let us consider an example. Assume that an electric motor with the following parameters is installed in the refrigerator: Uн =220 В,Iн =2,5 А, cosφ =0,9. The full capacity will be: S=UI=220*2,5 =550 ВА, and the active power capacity: P = UI cosφ = 220*2,5*0,9 = 495 Вт: So, let us calculate the reactive power:

$$S = \sqrt{P^2 + Q^2} \triangleright Q = \sqrt{S^2 - P^2} = \sqrt{302500 - 245025} = \sqrt{54475} = 240 BAp \quad (1.1)$$

It means that the above-stated value is about twice less than that of the fixed in the active power.

Theoretically, we could design a compensation device that would provide 240V to zero. Yes, we can, but what if the fridge is off? The thing is that 240 V has already been generated and, by compensating itself, it passes to the network. To avoid this situation, it is necessary to disconnect the compensator from the network. Doing such operations manually every time is futile, whereas automatic two-position devices are significantly expensive and cost-saving becomes next to impossible.[2]

Unfortunately, at present, most of the power plants that produce and supply reactive energy do not keep a separate accounting of costs that would allow to

[1] Потребители реактивной мощности https://studfile.net/preview/6438697/page:30/ 01.11.2022

[2] В чем разница между реактивной мощностью в быту и на производстве? https://elenergi.ru/v-chem-raznica-mezhdu-reaktivnoj-moshhnostyu-v-bytu-i-na-proizvodstve.html 01.11.2022

accurately calculate the amounts of the consumption fee or tariff for reactive energy. Therefore, it is necessary to make corresponding adjustments to the legislative field that regulates the energy sector, which would regulate the issues of classification, rationing, accounting, and reporting of costs incurred on the production of reactive energy.

Let us introduce some data on reactive energy in the Republic of Armenia. In particular, when studying the dynamics of the peak values of the reactive power of the RA EPP from 01/02/2022 to 31/01/2023,[3] it becomes clear that in the case of peak power it will be 654 MVAr in September, and the lowest will be 427 MVAr in April (see Figure 1).

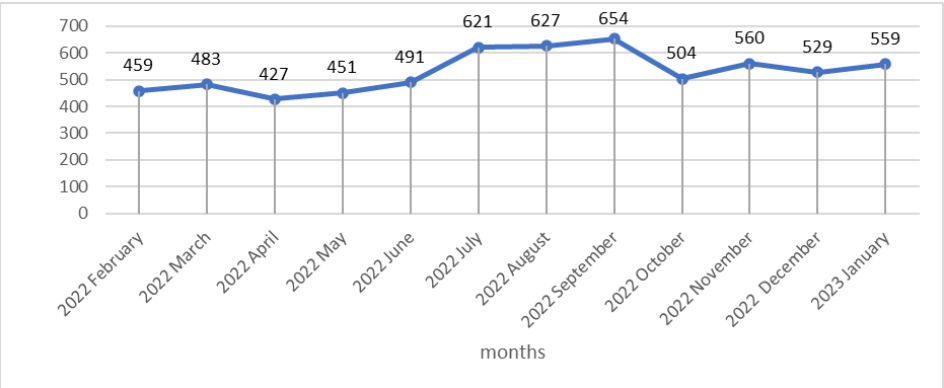

Figure 1. ***The dynamics of the reactive power peak values (MVAr) from 01/02/2022 to 31/01/2023 in the RA EPP.***

Let us discuss the information on reactive electricity-producing plants and cascades in the RA, particularly, the maximum of it is produced by Hrazdan Thermal Power Plant, making 350 MVAr, and the minimum - by Yerevan Thermal Power Plant, making 110 MVAr.

Table 1

Information on plants and cascades producing the maximum output of reactive electricity (MVAr)

Name of the production plant / cascade	*Maximum output of reactive electricity*
Armenian Nuclear power plant	260
HRAZDAN 5	280
Hrazdan Thermal Power Plant	350
Yerevan Thermal Power Plant	110
ARMPOWER	120
Sevan–Hrazdan Cascade	230
Contour Global Hydro CascadContour Global Hydro Cascade – wind power plant	240
Total	1590

We also present our analysis based on the annual forecasted balance of the reactive power of the RA electric power system for the period of 01/02 2022-

[3] Official information provided by the Public Services Regulatory Commission based on an application, https://drive.google.com/file/d/1vkO1UaSqgdh5rZ4h2_Hy3CJL2rhws2DG/view

01/01/2023, particularly according to the latter, reactive power will not be produced by "Yerevan-3" HPP and "Alaverdi" 220kV, as well as by Solar Plants. As for the volumes of reactive energy production during the mentioned period, it is mostly predicted to be produced by all TPPs: 1255.7 million KVAr/h, then by NPP: 1052.2 million KVAr/h,[4] and by all HPPs: 764.5 million KVAr/h. In total, it is planned to produce 6198.8 million KVAr/h.

As a result of not connecting to the minimum of the active load in the power system (especially at night), constant double compensation of reactive electricity has become frequent, which affects the increase of electric power losses and the complication of voltage regulation processes in the power system. In other words, as a result of different consumption volumes during the day and night, the expenditures on reactive electricity increase significantly. Reactive electricity consumption and production fee is determined via three components:

$$P = P\,1 + P\,2 - P\,3. \quad (1.2)$$

where

P 1 is the basic fee for the consumption and generation of reactive electricity,

P 2 is the surcharge for insufficient saturation of the consumer's electric network through reactive power compensation,

P 3 is the discount of the reactive electricity consumption and generation fee in case of the consumer's participation in the optimal daily regulation of the network modes of the energy supply organization during the calculation period.

The basic charge for consumed and generated reactive electricity is determined through the following formula:

$$P\,1 = \{n^*\}\,(WQ_{con} + K * WQ_{gen}) * D * T \text{ (drams)}. \quad (1.3)$$

Where n is the number of reactive energy calculation points.

WQcon - consumption of reactive energy in the calculation period at the billing point, Kilovar year (volume of reactive energy consumption during the year),

WQgen - generation of reactive energy in the network of the energy supply organization at the billing point of the calculation period, Kilovar year,

K - the norm coefficient for accounting the losses of the power system resulting from the generation of reactive electricity from the consumer's network,

D - characterizes the share of the reactive flow influence in the calculation mode at the billing point of technical and economic indicators, Kilowatt / Kilovar

T is the average price for the actual purchase of electricity formed during the calculation period (calculated in accordance with normative documents), AMD / Kilowatt hour.

[4] Official information provided by the Public Services Regulatory Commission based on an application https://drive.google.com/file/d/1vkO1UaSqgdh5rZ4h2_Hy3CJL2rhws2DG/view

The surcharge for undersaturation of the consumer's electric network through reactive power compensation is determined through the following formula:

$$P\ 2 = P\ 1 * Cbase * (K\ j - 1). \quad (1.4)$$

where

П1 is the total basic charge

Cbase = 1,0 - the normative base value of the coefficient of capital investments promotion through compensation of reactive power in the consumer's electric networks,

К j - the coefficient, which is selected from the specified table, depending on the actual coefficient of the consumer's power tgj, in the average calculation period:

$$tg\ j = WQ_P / WP. \quad (1.5)$$

where

WP - active electricity consumption for the current period, Kilowatt.

WQ_P - reactive electricity consumption for the same period, Kilovar/year

In the case when te value of tg J is higher than 2,00 K j for the selection we take tgj = 2,00

Discounting (non-payment or partial payment) of reactive electricity consumption and generation fee may occur in the following cases:

In the case of sufficient replenishment of the consumer's electric network with the equipment of reactive power compensation,

In the case of the availability of zonal calculation of the consumed and generated electrical energy,

In the case of the consumer's daily consumption schedule and electricity generation performance and its operational control by the energy supplying organization.

The consumption and generation schedules, as well as the discount amounts are agreed upon in the contract[5].

When understanding the nature of the active and reactive energy it becomes possible to accurately calculate the economic efficiency and minimize the loss of reactive load through the installation of different compensation devices. According to the statistics, those devices enable the physical and economic entities to increase the value COS φ from 0.6 to 0.97. Thereby, the automatic compensation device allows for saving up to a third of the electricity supplied to consumers. By significantly reducing heat loss, it increases the service life of equipment and machine products. As a result of all these, the amount of expenses spent on the finished products surely decreases.

To present the calculation formula, we apply the principle of ensuring the necessary revenue, which has wide application: in particular to calculate the reactive energy tariff the universal approach for average costs can be used:

$$R_{rev} = \sum_{n=1}^{i} R_{cost} + P + T. \quad (1.6)$$

where

[5] Как начисляют оплату за реактивную мощность? https://electrocontrol.com.ua/stati-sxemy-i-spravochnaya-informaciya/kak-nachislyayut-oplatu-za-reaktivnuyu-moshhnost.html 01.11.2022

R_{rev} is the reactive necessary revenue,
R_{cost} is the cost of generating reactive power,
i are types of costs incurred on reactive power generation,
P is the profit,
T are taxes.

Then the necessary revenue should be divided by the volume of reactive electricity production to determine the tariff of reactive power per unit.

As to the calculation of the active and reactive energy costs, it is worth mentioning, that according to the letter of "International Energy Corporation" CJSC[6], the company does not carry out a separate accounting of costs per active and reactive energies produced, therefore, the company has distributed the costs included in the approved tariff for 2022-2023 and other items of necessary income in a certain proportion to the components of active and reactive energies, the results of which are presented below(see table 2).

The distribution of expenses and other necessary revenue items according to active and reactive energy components was carried out based on the weighted average power coefficient (cosφ) of the hydro units of the "Sevan-Hrazdan" cascade HPPs[7], which shows what part of the total energy produced as a result of the hydro unit operation constitutes the active energy. According to the technical specifications of the company's hydroelectric units, their weighted average power factor is 0.81. Based on this ratio, the distribution of costs and other necessary revenue items according to active and reactive energy components was carried out in the following proportion: 81 percent was allocated to active energy, and the remaining 19 percent - to reactive energy.

Table 2

The costs of "International Energy Corporation" CJSC included in the approved tariff for 2022-2023[8]

	Active energy component (million drams)	*Reactive energy component (million drams)*	*Total (million drams)*
Material costs	129,7	30,4	160,1
Depreciation	1097,5	257,4	1354,9
Repair costs	379,8	89,1	468,9
Settlements with personnel (salary)	938,8	220,2	1159,0
Other costs	253,0	59,3	312,3
Annual license fee	12,2	2,9	15,0
Non-recoverable taxes	3,2	0,8	4,0
Mandatory settlement fees	5,7	1,3	7,0
Purchased electricity	122,6	28,8	151,4
Return of the borrowed funds for the rehabilitation of the Kanaker HPP	330,5	77,5	408,0
Costs related to raising a loan	48,4	11,4	59,8

[6] Official information provided by the Public Services Regulatory Commission based on an application, https://drive.google.com/file/d/1vkO1UaSqgdh5rZ4h2_Hy3CJL2rhws2DG/view
[7] Official information provided by the Public Services Regulatory Commission based on an application, https://drive.google.com/file/d/1vkO1UaSqgdh5rZ4h2_Hy3CJL2rhws2DG/view
[8] Official information provided by the Public Services Regulatory Commission based on an application https://drive.google.com/file/d/1vkO1UaSqgdh5rZ4h2_Hy3CJL2rhws2DG/view

Profit	2738,2	642,3	3380,5
Total	6059,6	1421,4	7480,9

Regarding the additional costs necessary for the production of reactive energy, we should note that the problem of additional costs arises when the company's hydro units must work with a lower capacity factor than is designed in their technical specifications for the supply of reactive energy required by "Electric Power System Operator" CJSC.[9] For example, per annual projected balance of reactive power for the tariff year 2022-2023 presented by "Electric Power System Operator" CJSC, to supply the required reactive power of the Company in April, July, September, and October 2022, the Company's hydro units should have operated with 0.69, 0.75, 0.63 and 0.44 power factors, respectively.

On the other hand, we would like to mention that, according to the letter of "ContourGlobal Hydro Cascade" CJSC, the following amount of reactive energy has been produced over the past 7 years (see table 3).

Table 3

Amount of reactive energy of ContourGlobal Hydro Cascade" CJSC has been produced over the past 7 years.[9]

Year	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*
Mln KVAr/h	505,7	577,9	457,8	364,1	240,1	422,9	175,4

It is anticipated to produce 197.4 million kVAr/h by the end of 2022.

The company operates Vorotan HPP,[10] the production of reactive electricity which is mainly combined with the production of active electricity, except for those cases when, based on the needs of the system, only reactive electricity is produced at the request of the operator (mainly at night hours), in the case of which additional costs and losses arise.

Individual reactive power generation, which is not combined with active power generation, accounts for about 20-30 percent of the total reactive power generation. In this case, the equipment is subject to wear and tear in the same way as in the case of active electricity production, for which, however, the company is not paid. In particular, when a hydrogen generator produces mainly reactive electricity without coupling to active electricity generation, each operated hydrogen generator loses water equivalent to approximately 1 MW active energy (idle loss), and also electricity for own needs is consumed (cooling system, oil pressure system, compressed air system, etc.). For additional information, it has

[9] ProposedLoan International Energy Corporation Sevan–Hrazdan Cascade Hydropower System Rehabilitation Project (Armenia), https://www.adb.org/sites/default/files/project-document/76138/46941-014-arm-rrp.pdf

[9] Official information provided by the Public Services Regulatory Commission based on an application, https://drive.google.com/file/d/1vkO1UaSqgdh5rZ4h2_Hy3CJL2rhws2DG/view

[10] Meeting the challenge. Annual report 2020, ContourGlobal plc, United Kingdom, 228 p. https://www.contourglobal.com/sites/default/files/2021-04/2020_annual_report_contourglobal_plc_1_0.pdf

been reported that no separate calculation of reactive power generation has been conducted.

For the reactive energy production, the company has already replaced the excitation system of the Tatev and Shamb HPPs within the frame of the Vorotan Cascade Technical Re-equipment Program upon the financial support of KFW bank.[11] Currently, the company is holding an open tender for the replacement of the excitation system of the Spandaryan hydroelectric plant, the results of which will be reported to the Public Services Regulatory Commission as soon as known. It was also mentioned that the abovementioned is included in the company's approved investment program for 2022-2024 with a cost of AMD 410 million.[12]

It should be also noted that under the conditions of the energy market liberalization model that came into force on February 1, 2022, Yerevan TPP takes on the function of balancing the market, which means that this state-owned enterprise is obliged to produce the required amount of active and reactive energy, zeroing actual deviations.

Conclusion: As a result of the research conducted within the framework of this paper, for each conclusion, we present proposals for solving the corresponding problem, which are as follows:

1. The Strategic Program for the Development of the energy sector of the Republic of Armenia, approved by Annex No. 48-L to the decision of the Government of the Republic of Armenia dated January 14, 2021, provides for the introduction of new mechanisms for adjusting tariffs for reactive energy, but currently no legal act of the Republic of Armenia provides the regulation of the latter. Therefore, we consider it necessary, first of all, to establish the term "reactive energy" in the main legal act of the energy sector in the Republic of Armenia, in the RA Law "On Energy" and in other normative acts arising from the mentioned law, to establish regulations concerning the mechanisms for calculating reactive energy, including separation of physical and legal entities.

2. The deadline for the event "introduction of tariffs for reactive energy for electricity consumers", provided in paragraph 4.3.2 of the program-schedule of strategic development of the energy sector of the Republic of Armenia (until 2040), approved by Annex No. 48-I to the decision of the Government of the Republic of Armenia dated January 14, 2021, is scheduled for December 2022, therefore we propose to discuss the issue of postponement the latter at least until 2025, because we believe that the transition to the calculation of reactive energy in the Republic of Armenia should be phased. In particular, we consider it expedient, first of all, having studied international experience, to introduce in the Republic of Armenia the appropriate legal framework for calculating reactive energy, then to implement an experimental program in organizations with the highest and lowest demand in the RA. After which, only depending on the obtained results, which are based on average figures, we shall gradually practise it in other organizations, operating in the Republic of Armenia.

[11] VOROTAN HPPS CASCADE http://www.minenergy.am/en/page/533

[12] Official information provided by the Public Services Regulatory Commission based on an application, https://drive.google.com/file/d/1vkO1UaSqgdh5rZ4h2_Hy3CJL2rhws2DG/view

3. Considering that the average citizen has no idea that energy dissociates into active and reactive energy, we consider it appropriate to conduct large-scale events in parallel with pilot programs in the Republic of Armenia to inform about the existence of reactive energy, the need for its calculation, the emergence of supply and demand, as well as to assess the advantages and disadvantages of calculating reactive energy for organizations residing in the RA, including the possibility of using means of compensation and replacement of reactive energy.

The above proposals in no way undermine the interests and balance of either businesses or citizens, the state of things remains.

Hence, from the prospect of energy saving, business, and social justice, it would be relevant that the customer should either pay for his/her factually consumed reactive energy or should install compensation devices with his/her own financial means, which are rather expensive. Otherwise, it turns out that the burden of costs for users of modern and powerful equipment falls on all customers in the form of loss.

References

1. VOROTAN HPPS CASCADE, http://www.minenergy.am/en/page/533
2. В чем разница между реактивной мощностью в быту и на производстве?, https://elenergi.ru/v-chem-raznica-mezhdu-reaktivnoj-moshhnostyu-v-bytu-i-na-proizvodstve.html
3. Потребители реактивной мощности, https://studfile.net/preview/6438697/page:30/
4. Proposed loan international energy corporation Sevan–Hrazdan cascade hydropower system rehabilitation project.
5. (Armenia), https://www.adb.org/sites/default/files/project-document/76138 /46941-014-arm-rrp.pdf
6. Как начисляют оплату за реактивную мощность?, https://electrocontrol.com.ua/stati-sxemy-i-spravochnaya-informaciya/kak-nachislyayut-oplatu-za-reaktivnuyu-moshhnost.html
7. Meeting the challenge. Annual report 2020, ContourGlobal plc, United Kingdom, https://www.contourglobal.com/sites/default/files/2021-04/2020_annual_report_contourglobal_plc_1_0.pdf
8. Official information provided by the Public Services Regulatory Commission on the basis of an application, https://drive.google.com/file/d/1vkO1UaSqgdh5rZ4h2_Hy3CJL2rhws2DG/view
9. «Про затвердження Методики обчислення плати за перетікання реактивної електроенергії», https://zakon.rada.gov.ua/laws/show/z0392-18#Text

ՄԻՔԱՅԵԼ ՄԵԼՔՈՒՄՅԱՆ
ՀՊՏՀ միկրոէկոնոմիկայի ամբիոնի վարիչ, տնտեսագիտության դոկտոր, պրոֆեսոր

ՍՈՒՐԵՆ ՊԱՐՍՅԱՆ
ՀՊՏՀ միկրոէկոնոմիկայի ամբիոնի դոցենտ, տնտեսագիտության թեկնածու

ԹԱԳՈՒՀԻ ԲԱՐՍԵՂՅԱՆ
ՀՊՏՀ միկրոէկոնոմիկայի ամբիոնի ավագ դասախոս, տնտեսագիտության թեկնածու

ԶԱՐՈՒՀԻ ՄԵԼՔՈՒՄՅԱՆ
ՀՊՏՀ միկրոէկոնոմիկայի ամբիոնի դոցենտ, տնտեսագիտության թեկնածու

ՄԱՐԻԱՄ ՏԻՏԻԶՅԱՆ
ՀՊՏՀ միկրոէկոնոմիկայի ամբիոնի հայցորդ

ԱՄԱԼՅԱ ԲԱՀԱՐՅԱՆ
ՀՊՏՀ միկրոէկոնոմիկայի ամբիոնի ասպիրանտ

Ռեակտիվ էներգիայի սակագների կիրառությունը որպես էներգախնայողության միջոց.– Հոդվածում վերլուծվում է ՀՀ էլեկտրաէներգիայի շուկայի ներկա վիճակը, ներկայացվում է ոլորտի օրենսդրական կարգավորումը, ինչպես նաև դիտարկվում են էլեկտրաէներգետիկական համակարգում սակագնային քաղաքականության հիմնական դրույթները: Ներկայում ռեակտիվ էներգիա արտադրող և մատակարարող էլեկտրակայաններից շատերը չեն վարում ծախսերի առանձնացված հաշվառում, որը թույլ կտար հստակ հաշվարկել ռեակտիվ էներգիայի սպառման վճարի կամ սակագնի մեծությունները: Հետևաբար՝ անհրաժեշտ է էներգետիկ ոլորտը կարգավորող օրենսդրական դաշտում իրականացնել համապատասխան փոփոխություն, որը կկարգավորի ռեակտիվ էներգիայի արտադրության վրա կատարված ծախսերի դասակարգման, նորմավորման, հաշվառման և հաշվետվությունների ներկայացման հարցերը:

Միաժամանակ առաջարկվել է ռեակտիվ էլեկտրաէներգիայի սակագնի հաշվարկման նոր մեթոդաբանություն:

Հիմնաբառեր. *էլեկտրաէներգետիկական շուկա, պետական կարգավորում, տարբերակված սակագին, սպասարկման վճար, սակագնային մարժա, գեներացնող կայաններ, ակտիվ էլեկտրաէներգիա, ռեակտիվ էլեկտրաէներգիա*
JEL: P28, Q40
DOI: 10.52174/1829-0280_2022.5-81

МИКАЕЛ МЕЛКУМЯН
Заведующий кафедрой микроэкономики АГЭУ,
доктор экономических наук, профессор

СУРЕН ПАРСЯН
Доцент кафедры микроэкономики АГЭУ,
кандидат экономических наук

БАРСЕГЯН ТАГУИ
Старший преподаватель кафедры микроэкономики АГЭУ,
кандидат экономических наук

ЗАРУИ МЕЛКУМЯН
Доцент кафедры микроэкономики АГЭУ,
кандидат экономических наук

ТИТИЗЯН МАРИАМ
Соискатель кафедры микроэкономики АГЭУ

БАГАРЯН АМАЛИЯ
Аспирант кафедры микроэкономики АГЭУ

Применение тарифов на реактивную энергию как средство энергосбережения.– В статье анализируется текущее состояние рынка электроэнергии РА, представляется законодательное регулирование сектора, а также основные положения тарифной политики в электроэнергетической системе РА. Большинство электростанций, производящих и поставляющих реактивную энергию, не ведут дифференцированный учет затрат, который позволил бы точно рассчитать суммы платы за потребление или тариф на реактивную энергию. Поэтому необходимо осуществить соответствующие изменения в законодательном поле, регулирующем энергетический сектор, которые урегулировали бы вопросы классификации, нормирования, учета и отчетности затрат на производство реактивной энергии.

В то же время авторами статьи предлагается новая методика расчета тарифа на реактивную электроэнергию.

Ключевые слова: *рынок электроэнергии, государственное регулирование, дифференцированный тариф, плата за обслуживание, тарифная наценка, генерирующие станции, активная электроэнергия, реактивная электроэнергия*
JEL: P28, Q40
DOI: 10.52174/1829-0280_2022.5-81