

ШАРОВА
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ЭЛЕКТРОЭНЕРГЕТИКА АРАБСКОГО ВОСТОКА:

ЭКОНОМИЧЕСКИЕ ТРЕНДЫ И НОВАЦИИ

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Предлагаемая монография представляет собой комплексное исследование современного состояния электроэнергетики государств Арабского Востока, ее проблем и перспектив. С помощью глубокого анализа технико-экономических показателей отрасли выявлены основные тенденции ее развития, включая: реформирование, объединение энергосистем государств рассматриваемого региона, а также расширение участия иностранного бизнеса в сфере генерации посредством государственно-частного партнерства. Показано, что в скором времени определяющим трендом развития электроэнергетики региона могут стать возобновляемая и атомная энергетика.

В работе дана ретроспективная стоимостная оценка советско-арабского сотрудничества в электроэнергетике. Приведены актуальные данные по российско-арабскому взаимодействию в указанной сфере. Представлены рекомендации по дальнейшему развитию и укреплению этих отношений.

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РОССИЙСКОЙ АКАДЕМИИ НАУК

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Монография предназначена для специалистов-востоковедов, проводящих исследования по проблематике становления, развития и реформирования электроэнергетики, а также для лиц, изучающих экономику развивающихся стран, и учащихся вузов, проходящих обучение по специальности «мировая экономика».

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SUMMARY

Electricity sector is a critical component of the energy system of any country, which allows electrification of social development based on sustainable power generation and distribution. Today, the electricity system is of primary importance to any country due to promoting its socio-economic development. This is because electric energy is relatively easy to transfer over long distances, distribute among consumers and convert into other types of energy (mechanical, thermal, chemical, light, etc.).

Because it underpins growth, has strategic importance and specific features of a commodity (primarily, generation and consumption equality at each point in time), electricity has traditionally pertained to a natural monopoly industry. Up until the 1970s–80s, the global electric power system successfully developed as a monopoly structure, meeting the needs of national economies and helping to improve human well-being. The presence of a monopolistic company in the industry, however, has both strengths (reduction of production costs due to economies of scale, unified management, planning and investment policy) and weaknesses (the company has monopoly power in the market, of which it takes advantage to artificially raise prices for consumers and secure super profits. Dealing with such shortcomings is precisely the aim of state regulation of monopolies, typically implemented in the power system by setting price limits and reasonable rates of return.

However, the imperfection of state regulation methods expressed in the lack of incentives for monopolistic companies to reduce costs and

improve operational efficiency and in minor price reduction for end users, as well as development of technologies in the power industry (primarily steam gas turbines that levelled out the beneficial scale effect) and enhanced intersystem relations laid the groundwork for reforming in the global power systems, aimed at restructuring the industry, diminishing the role of the state therein and boosting competition. The 1990s saw many countries begin to gradually implement liberal reforms in the power industry: 1982 – Chile, 1990 – the UK, 1991 – Argentina, etc. It can be said today that market transformations have affected most of the countries with a developed power system. However, the depth of such transformations and the competition level vary from country to country. Even though approaches to and methods for reforming the power system differ worldwide, depending on the features of national economy models, the general competition level and the maturity of state authorities, a similar sequence of steps can be seen in Latin America, Europe and the USA: changing the regulatory framework; separating natural monopoly (transmission, operational dispatch management) and competitive (generation, distribution) activities; privatising generation and distribution companies; providing free and non-discriminatory access to the infrastructure for all market players; granting freedom to producers and the right to choose a supplier to consumers.

The results of liberal reforms underway stir up continuing debates among economists, engineers, politicians and other specialists. In Russia, such disputes and numerous studies of foreign experience in reforming the electricity sector emerged in the late 1990s, when the law was drafted on reforming the Russian power system (approved in 2001), and continue to this day. Nevertheless, the problems that many countries faced during the first years after the start of market transformations (for example, speculation and collusion of power producers in the wholesale market in England and Wales to overcharge consumers, or inadequate investment in new capacities in Chile, which led to an almost complete lack of standby capacity in the system), do not detract from the validity and need of liberal reforms, since competition, certainly, encourages companies to cut down on costs, improve operational efficiency and quality of services provided. It also induces consumers to save electric power and

timely pay their bills. They only testify to complexity of the electric power system, versatility of processes and consequences of reform, and that it is not a universal solution to all the problems confronting the industry and requires a balanced and rational approach. While implemented, liberal reforms require extreme caution, clear consistency (all the more so as regards such a crucial industry as power supply) and objective evaluation of both positive and negative effects of transformations.

The Arab countries of Asia (except for Kuwait) did not remain aloof from the global trend in electricity sector either by starting liberal transformations of the industry, limited though they may be. The main and often the only measure for liberalising the electricity sector in the region was to authorise activities of independent power producers and to allow them into the generation sector. This was necessitated by the pressing problem of inadequate generating capacities and the need to meet rapidly growing demand for electricity. Thus, competition in the electricity sector of the Arab countries of Asia exists only between companies and consortiums that participate in tenders for building new and upgrading existing power plants and are awarded a contract if, all other things being equal, their bid for building one MW of power is minimal.

The emirate of Abu Dhabi, Jordan and Oman, which have built a “single buyer” model in their power system, are now a little ahead on the path of market reforms. But they, just like other countries in the region, have built neither a wholesale electricity market where power plants would compete for the right to sell electric power to a purchasing agency or directly to major consumers, nor a retail power market where supply companies would compete for the right to serve consumers. Most of independent power producers operating in the region have current product purchase contracts with a purchasing agency (as in Jordan or Oman) or with a public body responsible for operation of the industry.

Such contracts are entered into with a design organization that builds power plants under major infrastructure projects using project financing – a mechanism commonly applied worldwide, which has proved its effectiveness in the Arab countries of Asia: in 2000–2018, all the capacities commissioned in Bahrain, Qatar and Oman were built using project

financing schemes; in Jordan, such projects accounted for almost 75 %, in the UAE – for 73 %, in Saudi Arabia – for 34 % and in Kuwait – for 15 %.

The widespread use of project financing in the world is due to advantages of this mechanism both for a client state (for example, implementing large-scale infrastructure projects with considerable control over investors, minimum risks and expenses from the state budget, developing the national capital market and industry, improving the industry’s efficiency through competitive selection and private financing) and for the investor – risk sharing under a project among its stakeholders, the possibility of attracting investment in the volume substantially exceeding its assets. The Arab countries of Asia that make active use of project financing in power plant construction obtain such advantages by addressing the problem of inadequate generating capacity. These countries take their time before advancing further on the path of market transformations in the electricity sector, as any subsequent steps are likely to affect the pricing system – the most sensitive area for all states, especially for those in the region under review.

The Arab countries of Asia have set the lowest electricity tariffs in the world for the household sector, which was enabled by state subsidies accounting for 20 to 92 % of the current tariff. By setting such low tariffs for end-users, the state is pursuing a number of objectives, the most important, most likely, being to maintain political stability and loyalty to the ruling regime. That is why the governments of most Arab countries in Asia are so cautious and even slow in changing the pricing system in the electricity market. Adverse effects of such a policy are the wasteful consumption of electricity by consumers, the lack of incentives to save it, and enormous spending from state budgets. In Jordan, the cost of electricity is covered by the current tariff for the population. This, along with the built single buyer model and declared plans for further liberalisation of the industry, suggests the greatest depth and seriousness of market transformations among all the states in theregion.

Allowing independent power producers into the generation sector in the Arab countries of Asia resulted in deepened and intensified international cooperation. The largest players in the new capacity markets in the region under review are transnational corporations and companies from

developed countries: the most influential one is ENGIE that operates in 32 countries and has been a party in 22 out of 50 projects in the region, with a total capacity of almost 27,000 MW. It is the leading independent power and water producer in the region. In recent years, companies from the Asia-Pacific region, primarily from Japan, the Republic of Korea, Malaysia and Singapore, have also expanded into the markets of the Arab countries of Asia, followed by the largest commercial banks. This is a global trend typical not only of the power industry. The primary suppliers of electric power equipment to power plants in the Arab countries of Asia are global leaders – Siemens (Germany) and General Electric (the USA). Desalination plants are mainly fitted with equipment manufactured by Doosan Heavy Industries and Construction that owns 25 % of the world market.

Another global trend continuing in the Arab countries of Asia is building unified regional energy systems to reduce the installed capacity of power plants and capacity margins, and to facilitate repairs. At present, there are two projects for power system interconnection involving the Arab countries of Asia, but regional power exchange still plays minor role in their energy balances (according to various sources, electricity import does not exceed 4.3 % of final consumption, while export accounts for no more than 0.4 % of the total production). Intersystem power lines are basically used in emergencies, but the mutual assistance mechanism sometimes fails because, due to coincidence of load schedules, a neighbouring state may find itself lacking sufficient free power at the right time, which draws criticism from experts and researchers. In the mid and long term, this problem could be solved by investing in generating capacities in all countries of the region that will help increase available standby capacity, even during peak demand hours.

An increase in power trade among the countries of the region, which will foster deeper economic integration and open up opportunities for entering regional and international markets, requires creation of a common electric power market with economically adequate prices reflecting its real cost and taking into account production costs. This market cannot be created until each country implements reforms in its electricity sector, which will involve a transition from a vertically integrated structure to a

market structure of the electric power market and help introduce competition in the industry. In the current context, this will require time and sturdy policies on the part of governments. Technically, reliable UES operation in emergencies and commercial power trading are enabled by increasing the capacity of intersystem transmission lines in the GCC UES, since currently it accounts for 1.9 to 16.8 % of the peak load only. The economic rationale for intensifying power trade, just as any other commodity, is the difference in marginal production expenses. In the Arab countries of Asia, they are now nearly the same because of the similarity of technologies used and the structure of fuel and energy balances. However, diversification of energy sources declared by the governments of the countries in the region under review can dramatically change the situation in future and will be crucial given that fuel expenses determine the final cost of electric power. The state, where alternative energy sources, having almost zero variable costs, will constitute a significant part of the fuel and energy balance, will have the edge (all other conditions being equal) in the regional and international power markets.

Although in the Arab countries of Asia, hydrocarbons (gas and petrochemical products) are now the key stone of electric power generation and the share of alternative energy sources is insignificant (less than 1 % of the total production), population growth, economic development and climate change prompted many countries in the region to launch development programs for renewable and nuclear energy. The objectives pursued by the states are to satisfy rapidly growing demand, diversify fuel and energy balances, reduce dependence on hydrocarbons, protect environment, build high-tech industries and create new jobs. Renewable and nuclear energy is a new and promising area for development in the Arab countries of Asia.

In reality, introducing renewable energy sources is not as intensive as planned. This can be explained, first of all, by low electricity tariffs (capital investment in one MW of a solar or wind power plant is still, on average, higher than a similar parameter for conventional plants), as well as by the inertia of energy companies and public institutions, which is peculiar not only to the countries of the region. There are only few projects currently implemented in the field of renewable energy, and their

power is low. Bahrain, Jordan, Qatar, Kuwait, the UAE and Saudi Arabia have made the greatest progress in introducing renewables. Nuclear power projects were launched in the UAE, while Jordan and Saudi Arabia announced start of peaceful nuclear development programmes. Foreign energy companies (from Italy, Spain, Greece, the USA, and Russia) in cooperation with international energy organisations (IRENA and IAEA) are extensively involved in developing alternative energy sources and nuclear power engineering in the region.

Although the USSR was a traditional partner of the Arab countries in energy dialogue and played a crucial role in developing and establishing the electric power industry in the region, current presence of Russia in the region is insignificant. Russian energy companies are now implementing a few projects in Iraq, Syria and Yemen, but those are small-capacity projects or are intended for a specific activity (for example, equipment supply). Despite its participation in tenders, Russia is carrying out no large, noticeable projects for building conventional power plants in Arab countries. Russia lost its position in the region during the economic crisis of the 1990s as a result of decrease in production outputs and production capacity in Russia, loss of competitiveness by Russian companies and political reasons. Speaking about the loss of position in the region, it should be noted that cooperation in the Soviet era meant assistance to states loyal to the Soviet regime, was political in nature and had neither economic bases nor benefits. The fact that Russian companies have only few projects underway testifies to their insufficient competitiveness in the global thermal power market, lack of reputation and positive construction experience in other regions of the world. To attain strategic objectives and strengthen the presence of Russian energy companies in the Arab energy markets, they need to carry out multi-vector activities aimed at developing competitive advantages, as well as to continue and expand collaboration with potential partners (including international energy companies) and export credit organisations, take active part in intergovernmental and interstate arrangements, monitor market conditions in Arab states and participate in tenders for works and services in electric power engineering, or for supply of energy equipment.

The situation is different with Rosatom Corporation (Russia) in the field of nuclear power. Through its plants, Rosatom has succeeded in implementing peaceful nuclear development programmes launched in the UAE, Jordan and Saudi Arabia, using its competitive edges, such as advanced technologies (VVER reactors) meeting the most stringent safety requirements, complete solutions and flexible financing schemes (the BOO scheme (build, own, operate) previously used only to build conventional power plants), exchange of technical knowledge and local staff training. However, the key advantage of the Russian party in the nuclear power sector, as compared to its competitors, and the difference from companies operating in the thermal power sector is that Russia provides to a client country a complete fuel cycle in addition to NPP construction: from supplies of nuclear fuel throughout NPP lifetime to extraction, dumping and reprocessing of spent nuclear fuel. Leading the global market of nuclear technologies and ranking first in the world by the number of NPPs simultaneously under construction abroad, Rosatom Corporation is developing a new area in Russian-Arab energy cooperation.

It can be noted generally that electricity markets in the Arab countries of Asia are attractive for Russian companies. Strengthening their presence in the region and deepening bilateral ties could be mutually beneficial in the future, and searching for new partners becomes particularly relevant in view of the sanctions imposed on Russia in 2014 and “reorientation of its economy from West to East”. The current strengthening of Russia’s positions in economic and foreign policy areas is accompanied by deepening of international cooperation in various fields, and electric power engineering has always been a strong and competitive industry. Development of the Russian electric power industry and successful operation of Russian energy companies in global markets are directly dependent on attaining critical objectives, such as boosting scientific research, increasing R&D expenditures, developing breakthrough technologies and stepping up the manufacture of electric equipment.

Summarising the above, it should be noted that cooperation of the Arab countries with international companies and organisations has largely contributed to establishment and steady development of their electricity sectors. Opening up the generation for foreign participants,

the Arab countries of Asia not only solve basic problem of inadequate installed capacity, but also attract state-of-the art technologies, advanced experience and high standards of energy efficiency, security and reliability of energy supply. However, in order not to become completely dependent on foreign partners, the Arab countries of Asia should take steps to develop their national electric power industries by setting up production sites in their territories. This will be beneficial not only for the domestic market, but will also facilitate access to regional markets, thereby enhancing regional collaboration and cooperation. Along with the growing share of renewable energy sources and nuclear energy, this could become a strategic development plan for electricity sectors in the Arab countries of Asia in the years to come.