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**INTERNATIONAL ENERGY COOPERATION IN ELECTRICITY
TRANSMISSION, AZERBAIJAN PRACTICE**

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Abstract

During the research, it was proved that when creating an effective methodology for analyzing the importance of Azerbaijan Practice in an international cooperation, there is an objective need to consider all variables that may affect the mechanism for assessing its activities and making decisions. A current electricity transmission occurred, since the demand rose faster than the generation capacities increased. Amid the most recent decade, the Azerbaijan government has implemented a variety of mid- and long-term programs and projects to enable further capacities, and to ensure onward sustainable development. Therefore, importance of international cooperation in electricity transmission is increased.

The framework of the thesis includes a literature research to highlight the current challenges and to justify the need for a sufficient forecast method regarding an increased amount of Azerbaijan energy transmission. Therefore, knowledge about system loads behavior, such as evaluations regarding high demand scenarios and fluctuation bandwidths, is developed. The result contains a variety of information about the prospective supply, which might serve for trendsetting decision-making.

Acknowledgement

The accomplishment of my postulation to a great extent relied upon the consolation of different key job players. I wish to offer my honest thanks to my proposal counselor Ms. Parvin Mammadzade, Advisor to Chairman at the State Agency on Alternative Energy, for help and recommendations in research. What's more, I expand my appreciation towards the Dean of SABAH Groups, Mrs. Aida Qulieva. She doesn't know now and most likely will never realize the amount she helped me on my examination and my point of view.

Thank to my instructors, who have been there ceaselessly for me, and to everybody who has added to my advancement amid my examinations.

1.Introduction

Energy - the field of human economic activity, a set of large natural and artificial subsystems that serve to transform, distribute and use energy resources of all kinds. Its goal is to ensure the production of energy by converting primary, natural energy into secondary, for example, into electrical or thermal energy. At the same time, energy production most often occurs in several stages:

- the production and concentration of energy resources, an example is the extraction, processing and enrichment of nuclear fuel;
- the transfer of resources to power plants, such as the delivery of gas, coal, fuel oil to a warm power station;
- conversion of primary energy into secondary energy, using, for example, chemical energy of coal into electrical and thermal energy;
- transfer of secondary energy to consumers, for example, by power lines.

The main stakeholder in the field of energy security in Azerbaijan is internal and external to manage and control the market of energy and exports of oil and gas abroad. There are numerous institutional mechanisms in his hands. EBRD's 2010 Energy Sector According to the Country Report, the Ministry of Energy is the state in the energy sector policy and rules, and regulatory policy Ministry of Energy and Industry, Ministry of Economy and Industry and Tariff Council primarily by the United States. However, it should be noted that Azerbaijan the State Oil Company (SOCAR) represents the government in conducting international oil policy is a major subject what's more, is straightforwardly associated with significant oil and gas contracts as an investor. As Standard & Poor's Ratings Services admits, SOCAR plays a central role in the strategic sector of Azerbaijan, many international oil and gas investigation and creation as a shareholder, for example, in the ACG (Azeri-Chirag Guneshli) project and monopolizing this oil and petrochemical sector is an important tax payer. The domestic oil and gas market is in the hands of SOCAR with the law on the improvement and generation of oil and gas fields throughout Azerbaijan there is an exemption granted.²² Additionally, SOCAR's TAP (Trans Adriatic Pipeline) is 20% ²³ and it is the project of TANAP (Trans Anatolian Pipeline) will be the main financial sponsor and, according to the news, will be part

of his stake in the Shah Deniz (BP), a major partner in the project. The Ministry of Energy plays a more symbolic role in the energy sector, and key energy ventures are being actualized by SOCAR under its control and control.

Research methodology

The idea of the examination will be blended, utilizing exploratory and inductive research types. Because of exploratory research, the subjective strategy will be utilized so as to pick up bits of knowledge in elective vitality IB. The examination will utilize one of the normal subjective procedure plans. Following structure is proposed for system; in the main stage, different researcher articles will be utilized to discover the structure and the examples in execution what's more, usage of elective imperativeness.

In the second stage, approach will be used to assemble data through meetings, archives and perceptions of the picked nations. The exploration will concentrate on data and experience of driving elective vitality client nations, particularly creating nations. Besides, the methods for vitality security likewise, progression of elective imperativeness approach in Azerbaijan. In the prescient piece of the examination, the figure of things to come sway on the board and business culture of these nations will be given by summing up from the investigation of contextual analyses and the forecasts.

Chapter 2. Theoretical analysis

2.1 Theoretical and methodological basis of International electricity transmission

2.1.1 The concept of electricity transmission

The value of electricity for the life of the population and the functioning of the economy is such that it is practically impossible to do without it in the modern world. Electricity is a commodity that represents one of the most significant values among existing goods and services. Back in the twentieth century. Electric power

industry has become a key branch of the economy in the vast majority of countries. Electricity is an important factor in the main socio-economic processes in the modern world: livelihoods of the population and consumption of households; production of goods and services; national security; protection of the environment.

Electricity can be likened to air, which is rarely noticed, but without which life is impossible. If the supply of electricity stops, you find that the simplest everyday comforts suddenly become inaccessible, and the means that replaced those 100 years ago have long since disappeared. The branches of the economy that do not use stationary sources of electricity and do not work in a unified energy system are the exception in the modern economy - for example, automobile, water and aviation transport, crop production in agriculture or geological exploration. Nevertheless, in these industries, technological processes that require electricity are used. Without electricity, the production of most products would be impossible or would cost ten times more.

Electric power is a branch of the industry, which includes the production, transmission and sale of electricity. Electro energy is the most important branch of the power industry, which is explained by such advantages of electricity over the energy of other species as the relative ease species as the relative ease of transmission over long distances.

Modern electric power industry is the foundation of economic growth; it occupies key positions in the picture of any state. Without due production of electricity is unthinkable technical progress, it is impossible to sustain the development of critical areas and industries, unattainable high productivity, the modern level of culture and the normal life of all walks of life, every single person.

Technologies for wireless transmission of electricity, focused, in particular, on use in various mobile devices and audio / video equipment attract more attention of manufacturers. Particular interest in this area is shown by Japan, traditionally one of the leaders in the high-tech industry. To accelerate the commercialization and promotion of wireless power technologies, local manufacturers even set up the Wireless Power Feeding SWG working group within the Broadband Wireless

Forum. The Japanese have been able to communicate with Hiroki Shoki, a senior researcher at Toshiba's Toshiba center, who is active in Wireless Power Feeding SWG. As Mr. Soki noted, Toshiba has long been interested in this direction. Only a presentation by a group of specialists from the Massachusetts Institute of Technology (MIT) of scientific papers describing wireless transmission of electricity over a distance of several meters, made the company seriously think about the prospects of such technologies. In addition, other organizations, including the Ministry of Internal Affairs and Communications of Japan, became interested in potential wireless power supplies.

The exchange of power from the power plant to consumers is a standout amongst the most significant undertakings of the energy sector. Electric power is transmitted mainly over AC power transmission lines (AC); although there is a tendency to increasingly use cable lines and direct current lines. The need for electricity transmission to a distance is because electricity is generated by large power plants with powerful aggregates, and consumed by relatively low-power receivers distributed over a large area. The tendency to concentration of generating capacities is explained by the fact that with their growth, the relative costs for the construction of power plants are reduced and the cost of generated electricity is reduced. Placing of powerful power stations is made taking into account a number of factors, such as, for example, the availability of energy resources, their type, reserves and transport possibilities, natural conditions, the possibility of working as a major aspect of a brought together vitality framework, etc. Often, such power plants are significantly remote from the main centers of electricity consumption. From the efficiency of electricity transmission over a distance, the operation of unified power systems, covering vast territories. The process of globalization and the construction of supranational markets electric power industry demanded, first, the introduction of unified standards for the management of the electricity industry, and, secondly, the launch of the liberalization process. The so-called vertically integrated model of the energy market has ceased to serve as a stimulating factor for increasing the efficiency of existing and newly constructed facilities.

Power supply of industrial enterprises. Industrial enterprises consume 30-70% of the electricity generated in the electric power system. A significant dispersion of industrial consumption is determined by the industrial development and climatic conditions of different countries.

Electro supply of electrified transport. Rectifying substations of electric transport on direct current (urban, industrial, and intercity) and lowering the SS of long-distance electric transport on alternating current are powered by electricity from electric networks of EPS.

Electricity supply of domestic consumers. This group of PE includes a wide range of buildings located in residential areas of cities and settlements. These are residential buildings, administrative and administrative buildings, educational and scientific institutions, shops, health, cultural, public catering buildings, etc.

Structure of public administration power engineering in different countries differs a great variety of its member's controls. At the same time, in most cases an independent body is created, responsible for the implementation of reforms and the normal functioning of the market. Independent agencies operate in the USA (FERC), in England and Wales (OFGEM), the National energy administration in Sweden and Chile. Such structures also serve as instruments of state administration that have a certain degree of independence. The status of agencies and their independence create conditions for agencies to make decisions aimed primarily at increasing efficiency and market development, not based on the interests of individual participants or their groups, but from the interests of the industry, the economy in general and interests of individual (as a rule, neighboring countries).

The transfer of electricity from the power plant to consumers is one of the most important tasks of the energy sector. Electric power is transmitted mainly over AC power transmission lines; although there is a tendency to increasingly use cable lines and direct current lines. The need for electricity transmission to a distance is because electricity is generated by large power plants with powerful aggregates, and consumed by relatively low-power receivers distributed over a large area. The tendency to concentration of generating capacities is explained by the fact that with

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Electricity does not apply to storage resources. To date, there are no effective technologies that allow the accumulation of energy generated by generators, so the transmission of electricity to consumers is relevant to current problems. The cost of the resource includes the costs of its production, transportation losses and costs for installation and maintenance of transmission lines. At the same time, the efficiency of the power supply system directly depends on the transmission scheme.

In spite of the fact that in the internal networks of the majority of consumers, as a rule, 220/380 V, electric power is transmitted to them via high-voltage mains and is reduced by transformer substations. For such a scheme of work there are good reasons, the fact is that the greatest share of losses is due to the heating of wires.

There are two ways to transmit electricity: the method of direct transmission and transforming electricity into another type of energy.

In the first case, electricity is transmitted through conductors, such as wire or conductive medium. This method of transmission is used in air and cable power lines. The transformation of electricity into another type of energy opens up prospects for wireless supply of consumers. This will allow abandoning the power lines and, accordingly, the costs associated with their installation and maintenance. Below are the promising wireless technologies, the improvement of which is being carried out.

Unfortunately, at the current moment, the possibilities of transporting electricity wirelessly are severely limited, so it is too early to speak of an effective

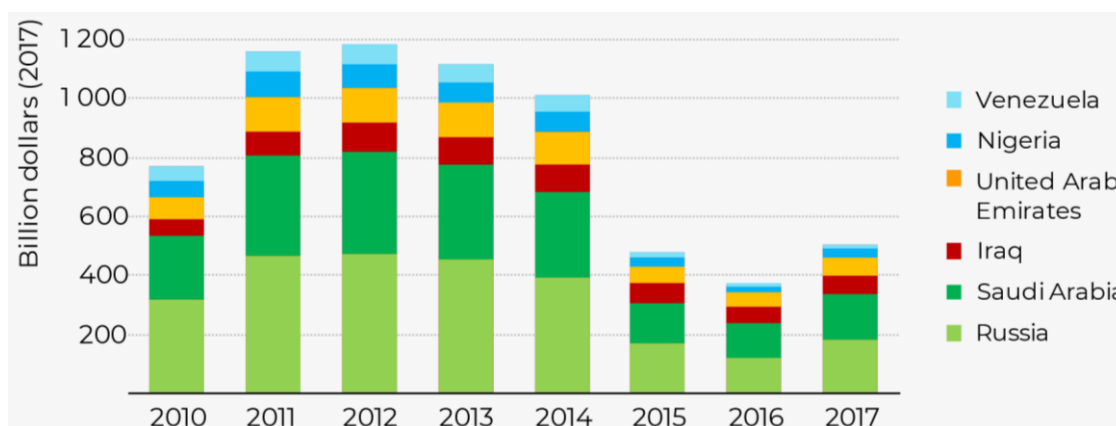
alternative to the direct transfer method. Research work in this direction allows us to hope that in the near future a solution will be found.

2.1.2 Institutional composition of International energy cooperation

Energy problem an integral part of the international connection. Interdependence in the energy sector and global energy markets cannon-confrontational interaction and mutually beneficial cooperation all players - such questions are on the agenda of the supporters of the two main paradigms in the theory of international relations are unrealistic and neoliberal.

An analysis of key theoretical approaches, participants in words foreign researchers, the ability not only to obtain a three-dimensional representation of the diversity of modern interpretations of energy issues, but also to identify their points of contact and semantic-conceptual relationships (Figure 1).

Figure 1. Net income from oil and gas in 6 selected producer economies



Source: Moran, Russell 2018: 1-19

Research into the problems of world energy built into basic theoretical disputes about the nature of international relations. In this case, most researchers, dealing with energy issues, continue to prefer analysis in the neo-realistic vein. Other in words, their focus is on energy policy of the states considered in the context of national interests and security, military confrontation and regional conflicts.

Stable and efficient energy supply, implemented based on market principles, is crucial for the development of the world community. Recently, the problem of such energy supply has become global due to the growing interdependence between producer countries, transit countries and consumer countries. Therefore, it is necessary to develop partnerships among all stakeholders in order to strengthen global energy security. The best way to achieve this goal is to form a free, open also, aggressive worldwide vitality showcase. In international practice, one of the most effective mechanisms for solving these problems is the creation of independent organizations. In the energy sector, there are a number of similar institutions, but the most prominent of them represent the interests of only one of the parties - the producer or the consumer. Thus, their activities contribute to the development of imperfect competition - oligopoly or monopsony. The rest of the organizations are either only engaged irregular activities, or are considering a narrow range of energy problems.

Therefore, to prevent global energy conflicts and achieve market equilibrium, it is necessary to create a global regulator in the energy sector - the international energy regulator (RES). RES is a non-profit organization whose main goal is the coordination of equivalent and commonly beneficial multilateral cooperation in the international energy market.

To achieve this goal, it is possible, having solved the following tasks:

- 1) Development of international trade standards for energy resources and monitoring of their implementation, as well as development of recommendations on various issues related to the functioning of the energy market;
- 2) Coordination of activities of national and intergovernmental regulators in the energy sector;
- 3) Implementation of economic, technical and other assistance;
- 4) Research of global problems of the world energy market, as well as development of options for their solution.

Implementation of the MED of these tasks is possible through the implementation of a number of functions.

The formation of global energy markets requires the creation of uniform rules and standards for all players. Compared with the market of a single product, the energy market is much more complicated, since there are several types of energy resources and the demand for energy is different in terms of consumption (transport, industry, household consumers, etc.). The determining role in choosing a specific energy carrier is its cost to the consumer. However, at present, there is no unified rules for pricing basic energy resources, which makes it difficult to determine the economic effectiveness of using one or another of their types. At the same time, an important component of international trade in energy resources is the spot market and the role of futures as a tool for pricing is likely to only increase. All these factors affect the volatility of energy prices and make it difficult to forecast long-term not only the performance of companies in the energy sector, but also the main macroeconomic indicators. The change in geological conditions, the need to apply the latest technological developments and the development of the energy market infrastructure significantly increase the total investment in new international projects. Their implementation is possible only if there is an equal division of risks in these projects and determining options for their reduction. For institutions and companies engaged in organizing the financing of international infrastructure projects in the energy sector, the conclusions of independent appraisers play a significant role. The presence of such conclusions may in some cases even contribute to a reduction in the interest rate on borrowed funds.

In the case of importing countries, speech, before everything, it is about the problems of guaranteed access to external sources of energy; including through military force. In the case of exporting countries, discourse shifts to questions not only and not as much as possible profitable sales energy, how much use energy potential in political purposes. The supporters of neo-realism are full of belief that in a world of hydrocarbons and strict competition in oil and gas market clashes between states are unavoidable. They do not always out grow in an open confrontation, but as rule, stimulate the arms race and can lead to an escalation of

the international tension. Not casually one of the key themes in the works of the neo-realist the power aspects of ensuring energy security.

In the monograph of American researchers David Moran and James Russell the risks of military confrontation are analyzed, arising because of growth that the beginning of the XXI century competitive struggle for energy resources. They consider conflict importing countries and exporting countries as on a global scale, and in key oil and gas bearing regions of the world. Separate attention in their work is given to the job of the United States, which are depicted as the main guarantor world economy and energy. One of the main conclusions to which authors of the monograph, - the global market energy raw materials to a large extent regulates itself, but it is not protected from the power confrontation between the states leading struggle for access to energy resources¹.

Neorealist views are adhered to and another American specialist Michael Clare is a publicist and military analyst, author of several books on energy problems. The most famous of them: "Blood and oil", "Wars for resources" and "Rising powers, contracting planet: a new energy geopolitics." In his works, M. Claire argued shows how in today's there is a fierce struggle for diminishing energy resources, fraught with military confrontation at the local, regional and even global levels. This fight transforms the entire international landscape, provoking the creation of competing interstate alliances.

Detailed analysis of energy aspects of US military strategy. Claire comes to the conclusion that Washington while not ready to abandon the "doctrine Carter" and will not only strive to preserve its geopolitical dominance in the Persian Gulf region, but also to extend it to other oil and gas regions of the world that have a strategic value. According to M. Clare, this circumstance is fraught with risks force confrontation, because China has adopted an expansion strategy military presence in the rich energy resources in regions, in particular in Africa. The only way to survive in a radically changed world lies on the paths of international cooperation, concludes the American researcher [Karle 2009: 44-65].

¹ Moran, Russell 2009: 1-19

Some representatives of the neo-realist view on international relations suggest considering the problem of energy safety in the context of control over oceanic spaces. Professor of the California Maritime Academy Donna Nincich notes that interstate conflicts over access to energy raw materials are inevitable in the new century, as the future of the world's oil and gas industry significant is associated with the development of subsoil resources. The world's oceans, whose borders continue to challenge countries. Disputes because of the resources of the South China Sea and Arctic clearly illustrate readiness States to vigorously defend their claims to access to energy². Military expert, former Navy officer USA Brian Wilson considers maritime security key component of their liability of energy supplies, since the latter assumes fight against illegal activities and emergencies on large spaces covering more than two third of the Earth's surface and providing ²80% of transportation. When most of the world's ocean is beyond the jurisdiction of States that nevertheless have to provide protection of 11 thousand oil and 1.5 thousand gas tankers from terrorist and other threats.

A geopolitical approach to studying world energy is popular in academic circles. In many respects, it is close to neo-realistic estimates. As a rule, in the center of geopolitical analysis is the struggle of the leading power for access to sources energy raw materials. It can be about attempts to establish a direct or indirect control over certain raw areas or routes transportation of energy carriers, as well as on the policy of geographical diversification export or import of energy resources in order to ensure national security. In the scientific literature even the term "geopolitics" energy (geopolitics of energy), which, in particular, uses the mentioned. Claire³, as well as specialists from the Brookings Institution Carlos Pascal and Evi Zambetakis. The latter note that the US and the EU, which is among the largest importers energy carriers, pursue the same goal is to provide access to external sources of energy raw materials. However, the ways to achieve this goal Washington and Brussels differ. The US, which is more dependent on imports oil, show increased interest to the

² Karle 2008:

³1- 9 Nincich 2009: 31-44

region of the Middle east, where concentrated the world's largest reserves of this resource. Rapid growth oil production, caused by the so-called shale revolution, has not yet rescued from the status of net importer oil. Therefore, as of December 2015, about one third of the crude oil consumed in the United States had an import the origin and one-fifth of that volume was in the countries of the Middle East.

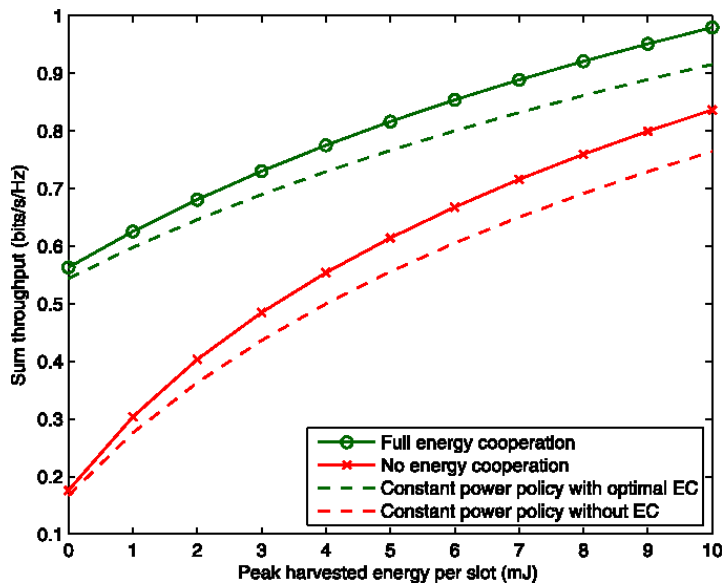
Modern energy research spheres are often characterized by theoretical eclecticism. Traditional the dispute between the neo-realists and neo-liberal theories are today all less fundamental in nature. The interpretations in the spirit of these two "classical" schools are successfully complemented by research, based on alternative approaches - constructivism, international political economy, and neo-Marxism. As the international energy relations variety of modern theoretical will be complemented by new research programs.

2.1.3 Electricity transmission opportunities and challenges in the world

In the XIX century, the time of rapid technical development, only crazy scientists and science fiction writers dreamed of wireless units. However, it was then that the world was lucky to meet a brilliant man, the inventor and "father" of electricity - Nikola Tesla. In addition, it is the American (but Serb in origin), the student of Edison, who owns the fundamental principles of the improvement of remote power transmission (Figure 2).

Figure 2. Energy use in a country ⁴

⁴ data of U.S. Energy Information Administration



Source: Moran, Russell 2018: 1-19

It all began in 1892, when Nicholas at a scientific conference in London managed to conduct a current through one wire, that is, along an open circuit. At the same time, the copper "cord" remained cold (as if it was a superconductor with zero resistance and an infinitely small cross-sectional area), and the second pole of the test system was not grounded. A couple of months later, in Sant Lewis, Tesla lit a light bulb without using any wires and showed a prototype of the first (and then only) wireless motor in the world. Many viewers considered the inventor a wizard.

In addition to the importance of providing services at competitive prices, suppliers energy must not forget about compliance high quality standards of work (Table. 1).

Table 1. Factors of high quality

effective interaction with a view to creating an infrastructure that guarantees energy supply in the medium and long term	preserve respect to the environment especially in a negative public reaction for continued use polluting production technologies energy
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Source: 2017-01_IntegralQualityStandardsCommitment_-_revised.pdf

A variety of challenges that currently moment facing energy companies encourage them to transform used business models. Within the framework of such a transformation. Some companies are looking for ways to:

- More effectively manage investments and operating costs;
- Actively integrate various sources power generation: from low power or then again the creation of sustainable power source and different sources of distributed generation to larger power plants on traditional fuel;
- Power industry problems;
- Promote rapid development new electric power technologies, ensuring good governance power systems in which large the role is played by renewable sources distributed generation, storage electricity, electric cars, programs demand management, etc.;
- Take business to international level using the possibilities for development in new markets and to achieve economies of scale in order to maintain competitiveness.

Despite the lack of consensus about the future development of the world energy industry, one thing is clear: it is on the verge of scale changes. The answer is the energy companies such changes will depend on the region their functioning, regulatory environment, asset portfolio structure, dynamics consumer demand and level of implementation innovation technology. However, under most scenarios future energy company will act as a link between multiple sources of generation electricity (from small-distributed renewable production capacity energy to larger power plants on traditional fuels, micro grid sand charging stations for electric vehicles) and consumers. To achieve the energy goal companies from the manufacturing need transform into a service one (for the most parts) providing effective energy solutions that coupled with high quality standards service.

Obviously, today's model energy companies are outdated and its cardinal transformation is required with a focus on balancing between aspirations to satisfy needs customers and ensure proper returns for shareholders. The rate of change is

largely depends on the location of the business because conditions of demand ⁵ development, regulation carbon emissions, distribution, transmission and retail sales of electricity, as well as market structure, etc. vary by region. As part of the analysis we put aim is not the creation of the energy roadmaps, but rather, identifying the driving factors that will determine the development energy companies in different regions of the world.⁵

The creation of more effective and efficient methods of generating electricity enabled the creation of competitive mechanisms in the energy sector, with the help of market economy advantages, and led to the emergence of conditions that would increase the effectiveness of electricity production and transmission and eventually lead to lower consumer prices. These results can only be achieved with the effective use of electricity. For example, the decline in efficiency in the electric power industry in Azerbaijan is seen as an increase in commercial losses, overloading of equipment and a reduction in competitiveness of enterprises. Depreciation of equipment, reduced efficiency of investments in the electricity sector and low energy savings will lead to a deepening of the problem in the future. The first stage of the energy-efficient use should be technological, organizational and scientific-technical measures that address the realities of today (lack of energy tariffs, lack of energy saving interests). Indeed, given the fact that our republic does not have energy saving mechanisms, nowadays the administrative methods of management, the people responsible for energy saving and the management of the financial compensation system are used. Measures that require great investments have long-term and significant energy-saving effects are postponed. At the same time, these efforts are not undertaken unless there is no obstacle to the preparation and implementation of methodological guidelines in the field of demand management.

Increasing energy efficiency requires the solution of a complex of economic, organizational and technical issues related to the overall effectiveness of the sector's performance and development. Effective technologies should be stimulated, demand

⁵ Steurer, R., and A. Martinuzzi (2017). From environmental plans to sustainable development strategies. *European Environment*, 17(3).

management capabilities should be expanded, energy costs for technological needs should be reduced, and efficiency of existing equipment should be increased. Tariffs, depending on time and place, should bring positive signals to the electricity market. The price should be closely linked to the real situation along with the implementation of strategic goals. The current three-tier tariff system does not mean all of these inclusions. Increasing the efficiency of fuel and energy use and reducing losses should form the basis for improving energy efficiency.

The global economic crisis has revealed a contradiction between the state of modern energy and the needs of social development. The rise in prices for hydrocarbons in 2001–2008 accompanied the economic upturn and became one of the factors for its strangulation. The alternative energy sources defended by the authorities and corporations do not reduce the cost of it and do not threaten the situation.

The crisis of traditional hydrocarbon energy humankind faced in the early 1970s of the twentieth century. The official science, recognizing, with reservations, the existence of a crisis, pointed out nuclear power as an exit. When it became obvious that the possibilities of nuclear energy were more than modest, they began to advertise TOKAMAK-based thermonuclear power plants as a distant prospect. Experiments in this area have been going on for half a century, and there are no power stations yet. But during these half a century, practically without the support of official scientific structures, and often despite them, a new research direction has emerged, which can rightfully be called innovative energy.

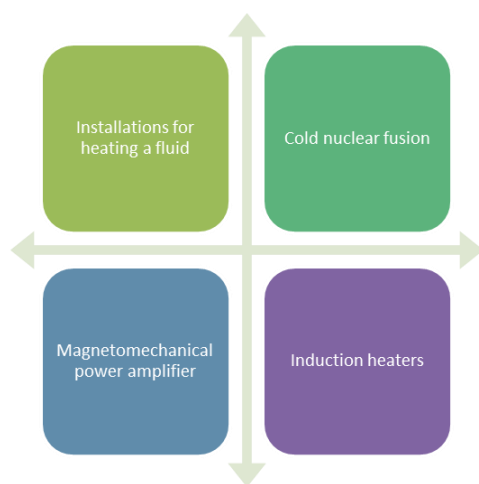
After the crisis for world capitalism of the 1970s, a long economic recovery followed. It was not based on the renewal of energy or the general distribution in the production of robotics, its limited implementation combined with the use of cheap low-skilled labor. The energy of human muscles, ruthlessly exploited in the countries of the periphery, has become a source of neoliberal "energy" revolution. By 2008, its capabilities were exhausted. In the conditions of the current crisis, a new one is needed - a genuine, not a liberal sweatshop, revolution in the energy

sector. Without it, it is impossible to resolve the accumulated contradictions and reach a subjectively new phase of financial improvement.

Traditional energy needs not so much the addition, as in the crowding out, the earliest replacement with innovative technologies. This means the inevitability of a kind of “investment shock,” when at the same time significant investments made earlier and the need for massive new investments will be devalued. Development in such conditions can hardly be achieved without the active participation of the state and the nationalization of the industry, allowing it not only to withstand the “investment shock”, but also to carry out the transformation in a comprehensive and effective manner based on a single scenario.

At the beginning of the 2010s, there were about ten promising approaches to the development of a fundamentally new energy. In some areas of the search, certain practically significant results have already been obtained; in others, research is being conducted at the level of laboratory or semi-industrial models. Even in the US and the EU, governments and big business with a hidden fear are among scientists who dream of overthrowing the old energy industry. It is not yet clear which direction will be most effective for the production of energy, mainly electricity (Table 2).

Table 2: Types of innovative energy



Source: Свидерская ОВ. Основы энергосбережения: ответы на экзаменационные вопросы// О.В. Свидерская. Минск: тетраСистемс. 2008. — 176 с.⁶

⁶ IRENA (2015b), “Renewable Energy Auctions in Developing Countries”, www.irena.org/DocumentDownloads/Publications/IRENA_Renewable_energy_auctions_in_developing_countries.pdf.

Energy companies need to transform their management models in order to adapt to changes such as falling prices, leading to lower profitability; improving the quality of supply in the energy market; increased attention to environmental protection, the emergence of new technologies, the times that move the traditional business framework through a focus on technical asset management, and much more.⁶ This means that energy companies must develop their business in such a way that:

- Form a more market-oriented, customer-oriented and service delivery with higher value added;
- Choose a business model in which environmental awareness becomes a competitive advantage;
- Provide infrastructure management to meet new requirements and improve quality standards;
- Intensify the use of information and telecommunication technologies; work in international markets, especially in those where profitability rates may be higher than in traditional markets.

Due to the high volatility of electricity prices and changing conditions in the energy sector (for example, the spread of distributed generation, the tightening of environmental regulations, the volatility of fossil fuel markets, etc.), in many cases it is enough for companies to develop flexible strategies to take advantage of the uncertainty and adapt their business models to market changes. In certain nations, the far reaching utilization of sustainable power source, coupled with a reduction in demand because of the economic crisis, has led to a sharp decline in prices in the wholesale market. Within this scenario, competitive advantages can be gained using flexible approaches. All of these approaches must take into account regulatory projections that will allow energy companies to make informed decisions about the structure of a portfolio of generating powerful assets.⁷

⁷ ru_The_future_of_global_power_sector_RUS (1).pdf

Currently, a number of the most significant energy markets are revising operating models in order to adapt to a new level of renewable energy, as well as abandoning models that stimulate the development of models that stimulate the development of traditional power generation technologies. At an operational level, the decline in profitability of the electricity generation business companies optimize capital and project management while making new investments, reduce operations investment costs, improve the efficiency of fossil fuel purchases, and control appropriate supply chains.

2.2 Energy cooperation policy of Azerbaijan

2.2.1 Drivers of energy cooperation policy

The Republic of Azerbaijan has rich energy resources. Developed fuel resources, energy infrastructure, and a full self-support system electricity. The gradual transformation of the country into one of the key elements of the global energy system, its special place in the transnational energy markets and active participation in ensuring energy security Europe, had a great influence on the strengthening of its geopolitical and geo-economic positions on the global and regional level.

Azerbaijan's energy resources are not only the basis for the dynamic development of all sectors of the national economy but and perform as decisive formation factor of gross domestic product, main financial and economic indicators of the country. Therefore, the effective use of existing natural resources and fuel and energy potential creates one of the main guarantees of sustainable economic country development and economic security. In the geopolitical literature, energy security considered as one of the important components parts of national security. Under energy, security is understood: the security of the whole country, its citizens, society and economies from external and internal threats by uninterrupted fuel supply and energy.

External threats include geopolitical arising from outside. Macroeconomic issues, and to internal - problems directly related with national energy sector of the country. The basic principles of energy security are:

- reliable energy supply of strategic and other important objects;
- replenishment of used fuel stocks;
- diversification of energy sources and fuel;
- consideration of environmental requirements;
- prevention of inefficient use energy resources;

Creation of free economic conditions for effective energy exports to domestic and overseas markets and getting from them the necessary income⁸.

Basics of the energy security policy of Azerbaijan, the principles for ensuring it were laid down by signing "Contract of the Century" and reflected in realizable since 1994, the new oil strategy. Besides, in many accepted in 2003–2010-s official state documents are reflected transnational and the national energy policy of Azerbaijan, realizable in this area measures and other related issues with energy security. Among them is the Law of the Republic of Azerbaijan. "On Energy", "On the utilization of option and Renewable Energy Sources", State The program "Development in 2005-2015 s fuel and energy country sector"⁹.

Currently, the Azerbaijani state is conducting flexible energy policies aimed at creation of independent from external influences national energy sector and ensuring sustainable economic development. Priorities for this policy are composed in conservation and efficient use of natural the country's energy resources, the development of national energy sector full and sustainable meeting the domestic needs of the population and economics oil, gas, electricity, other sources energy. Coordination of international, regional and local energy interests and security overseas countries of the Caspian region with national interests Republic, addressing other strategic issues stemming from the country's energy security.

⁸ Law of the Republic of Azerbaijan "On Energy" //www.mie.gov.az/cgi-bin/min/main.cgi.id

⁹ <http://e-qanun.az>

The Republic of Azerbaijan, which has recently gained its independence, was the first to initiate the opening of the Caspian Basin. Azerbaijan considers the use of its oil and gas resources as a major instrument of economic development and an important factor in strengthening the country's security, sovereignty and independence. During the period since the "Contract of the Century" was signed in 1994, Azerbaijan has signed more than 20 agreements for the development of hydrocarbon deposits and has done a great deal in their implementation. These agreements, which are concluded with companies in the United States, Great Britain, Italy, France, Norway, Russia, Saudi Arabia, Turkey, Japan and other countries, have brought and brought large amounts of investment and revenue to the Republic. Thus, the course, directed to the involvement of foreign companies, mainly western companies, into the energy projects of the Caspian Sea, known by the Azerbaijani government as "oil diplomacy," has already given and continues its practical benefit.

However, the implementation of these projects, which serve the development of Azerbaijan, has not been easy. Since 1994, after the signing of the "Contract of the Century", the appointment of another legitimate status of the Caspian Sea suddenly became a problem in connection with the collapse of the Soviet Union as a result of the involvement of some forces in the issue, which was the sovereign right of Azerbaijan, aiming at obstructing any business in a particular sector. However, the principle of division of the seabed into the national sectors, supported by official Baku, has been taken as the basis of Azerbaijan's determination to defend its position, because of bilateral agreements with Kazakhstan and subsequently with Russia.

The ongoing process of negotiations with Turkmenistan and Iran in this area will most likely give its results, and thus, new horizons will be opened to co-operation for a more dynamic development for all Caspian littoral states.

History of the Baku-Tbilisi-Ceyhan strategic oil pipeline, signed by the Presidents of Azerbaijan, Turkey, Georgia, Kazakhstan and the United States during the OSCE Istanbul Summit in 1999 to deliver Azerbaijan's increasing oil production and the hydrocarbon reserves of the Caspian region to the world market political

declaration was adopted. In September 2002, a ceremony began at Sangachal Terminal close Baku with the interest of Presidents of Azerbaijan, Georgia and Turkey. From that date, the pipeline construction process has been successfully implemented and the Caspian oil, which is transported through this pipeline in 2005, should already be exported from the Ceyhan terminal to the world markets. This, in its turn, will allow Azerbaijan and the whole region to enter a subjectively new phase of advancement.

At the initiative of Azerbaijan in February 2015, the First Consultative Council of the Southern Gas Corridor was also held in Baku. The Declaration adopted by the Council reaffirms Azerbaijan's leadership role in this transnational project. This event was held to create a coordination among project members. The implementation of this project draws attention to a number of important historical issues. As the experts point out, the Caspian region's gas supply infrastructure will be able to alter the energy map of the entire region, diversify the energy corridors, and enhance Azerbaijan's role in the energy security of the European region. The work done towards the implementation of the Southern Gas Corridor project is of particular importance. One of the most important events on this project in the first quarter of 2016 was the second meeting of the Southern Gas Corridor Advisory Council in Baku on 29 February.

Such meetings held within the Advisory Council are of paramount importance for the political discussion of the project, as well as the joint search for the solutions to the problems arising during its implementation in transit countries. The highest level of participation of delegates from the world's leading States and international financial institutions at the Advisory Council's second meeting also confirms this. The views of the second meeting of the ministers within the Advisory Council and the views expressed in the discussions show that the gas delivered through this corridor will have an important place in the supply of European countries. The great interest of large European countries such as France, Spain, Italy, and Greece is also confirmed.

We can safely say that the Southern Gas Corridor and the Caspian region are among the EU's top priorities. It should be noted that the Southern Gas Corridor, which is being implemented in recent years for the transport of energy resources to Europe, has become the most advanced project for other energy resources in the region. The Southern Gas Corridor Project, proposed by Azerbaijan, is one of the largest infrastructure projects in Europe over the next few years, with a combined investment of over \$ 45 billion. The TANAP project, which has been regarded as a step forward for the real integration of Azerbaijan into the global energy system, started in 2012. In 2013, the TAP project was selected as the main export route. At the end of 2014, the cornerstone of the Southern Gas Corridor was laid. This project strengthens Azerbaijan's geopolitical position.

Work on the Trans-Anatolian Pipeline (TANAP) project in the first quarter of 2015 continued uninterrupted. Thus, planning works on planning have been completed. In addition to the pipeline, the planning engineering of the compressor and measuring stations intended for construction is in the ready condition. In 1350 km section of the pipeline, pipes have been delivered to the construction site and welding works are under way.

Thanks to the continued political will of the Head of State Mr. Ilham Aliyev, the Trans Adriatic Pipeline (TAP) project, which has received the necessary support from the international community, eliminates the difficulties in implementing the project, "An important document such as the Environmental and Social Impact Assessment was adopted by the Albanian-Italian governments of Greece has been submitted. At the same time, the TAP project was included in the list of 33 priority energy security projects of the European Commission, which serves common interests.¹⁰

The participation of senior officials such as the Vice President of the European Commission Federica Mogarini and Maros Shevcovic, the US Department of State's Special Representative and International Energy Coordinator Amos Hockstown at the meeting of the Advisory Council, not only informs the international and

¹⁰ <http://newtimes.az/az/economics/5655/>

transnational content of the Southern Gas Corridor Project, is appreciated as a focus. Experts point out that holding of the next meeting in Baku once again proved that Azerbaijan plays a decisive role in the implementation of the Southern Gas Corridor project and has a great influence on regional and global scale as a serious economic and political partner. One of the most crucial aspects is the fact that the participant countries once again declare that the necessary support for the project will be continued.

Marco Shevchovic, vice-president of the European Commission for Energy, stressing that the achievement of access to the European market of hydrocarbon resources of the Caspian Sea for many years has been a subject of discussions, but we have never been so close to it, and ongoing construction work in Azerbaijan, Georgia and Turkey The fact of allocating billions of dollars is a remarkable event: It is a very strong move.

The energy factor in the foreign policy of Azerbaijan continues to maintain its important position. Azerbaijan's energy policy has been focused largely on similar targets over the past 25 years, although significant changes have taken place in Azerbaijan's overall foreign policy strategy during the rule of the various leaders. Azerbaijan, because of these policies, is now able to provide its own energy security , just as assume a key job in the vitality security of some other states. The energy factor assumes a significant job in the relations among Azerbaijan and Georgia and Turkey, and assumes a significant job in the relations among Azerbaijan and the key European states, just as some Eastern European nations. Azerbaijan has faced a number of challenges while trying to implement its energy strategy. Especially Russia and Iran's resistance and internal instability have been more effective. However, the withdrawal of Russian military bases from Azerbaijan and the inability of any foreign military presence in Azerbaijan in general enabled the successful implementation of the balanced foreign policy course and free energy policy determined during Heydar Aliyev's period.

During the reign of Heydar Aliyev, Azerbaijan considered Russia, but persistently continued its Western-oriented projects. In addition to the BTC, the SCP

(including the Baku-Supsa pipeline and oil transportation to the Black Sea coast of Georgia), the implementation of TANAP proves this.

Despite the tough resistance of Russia and Iran, Azerbaijan has not changed its position on the status of the Caspian Sea, attracted western companies to the oil and natural gas production in the Caspian Sea, and even co-operated with the other Caspian region (Kazakhstan and Turkmenistan) in the field of energy. At certain times, Azerbaijan has encountered relatively more serious problems in this area and has never been able to solve these problems. For example, on July 23, 2001, an Iranian warplane crashed on Azerbaijan's Geofizik-3 and Alif Hajiyev vessels conducting an investigation into Alov oil field and violated Azerbaijan's airspace in accordance with an earlier international agreement signed in the Azerbaijani sector of the Caspian Sea ¹¹. Later on, the Iranian warship said that it would approach the Azerbaijan ship Geofizik-3 and abandon the region, otherwise it would use force. In addition, Iran's airplanes have repeatedly violated Azerbaijan's airspace. That is why Azerbaijan is still unable to continue its operations at the Alov field. The problems with some deposits between Azerbaijan and Turkmenistan remain unresolved. Nevertheless, despite all this, Azerbaijan's energy policy is successful. This successful policy contributes to Azerbaijan's own, regional, and global energy security as well.

2.2.2 The role of Azerbaijan in global electricity transmission

In the middle of the last century, the control of equipment was largely transferred to electronic systems, which made it possible to significantly increase the rate of use of energy processes - thousands or even hundreds of millions of times. This gave rise to an explosive acceleration of managerial production processes. The time of social change was compressed to the limit, which is especially striking when comparing the time intervals for the development of the processes of the industrial

¹¹ *Iran Is Accused of Threatening Research Vessel in Caspian Sea. / July 25, 2001/-*
<http://www.nytimes.com/2001/07/25/world/iran-is-accused-of-threatening-research-vessel-in-caspian-sea.html>

revolution and that, which was called the scientific and technical one. If the industrial revolution lasted for about three centuries, the deployment of the scientific and technological revolution took about 60 years, giving rise to a huge number of global problems that arose based on the apparent excess of the scope of human activity limits of the biosphere. At the same time, first, the limits of those resources that had always been considered to be self-replicating in the biosphere were designated, and therefore the name of the “inexhaustible” —to fresh water, air, climate stability, bioresources, etc. — was fixed to them. Depend on the ecological state of the biosphere, which has rapidly begun to change for the worse under the anthropogenic impact of a person who is not used to seriously considering the limits of the biosphere. However, among all the factors of the destruction of the biosphere, perhaps the most dangerous and imperceptibly developing is that generated by the antibiospheric human energy activity. Energy production in the world is constantly growing, doubling every 5–7 years. Moreover, more than 80% of modern energy is fuel using fossil hydrocarbon fuel. This energy releases into the environment a huge amount of not only chemical waste, but also physical waste in the form of radiation and waste heat, which inevitably causes heating of the atmosphere. It is thermal waste that turns out to be the most dangerous for the biosphere and man, since their impact on its condition is complex and far-reaching in its consequences, because with the change in the thermal regime of the biosphere the whole picture of the physical and chemical processes occurring in it changes dramatically.

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The report that in other European nations, including Spain, Germany and the UK, the offer of wind and sun based vitality will surpass 25% of absolute generation.

As per the Decree of President Ilham Aliyev, in 2013, the State Agency of the Republic of Azerbaijan on Alternative and Renewable Energy Sources was made, and various archives were marked and programs were embraced to build up this industry. These records accommodate conveying elective sources to 20% of the all

¹² <https://www.socionauki.ru/journal/articles/129857/>

out vitality utilization of Azerbaijan before the finish of 2020. Clearly the improvement of elective vitality is incorporated into the quantity of need headings of state advancement. According to research, in Azerbaijan there is a huge potential for creating power utilizing sustainable power sources. The proficiency of utilizing some elective vitality source legitimately relies upon the district in which the establishment of hardware is vital. For instance, on the Absheron Peninsula, the climate is frequently blustery - the breeze blows around 300 days a year. Specifically, in the town of Shubany, 227 days a year the breeze blows at a speed of in excess of 75 km/h and higher. In addition, bright days on the Absheron Peninsula represent over 200 days a year, and on summer days, the temperature frequently achieves 40 degrees. The all out capability of sunlight based vitality is assessed at 500 megawatts, while the potential for wind control age is 350 megawatts.

In 2017, energy was imported over 107.8 mln. kWh / hour.- Export, on the contrary, amounted to \$ 1.282 billion. kWh/h. During the first 9 months of the current year, electricity was exported to the amount of 107.4 million kilowatt-hours, compared to 750.6 million kilowatt-hours of electricity. 587.9 million kilowatt-hours to Georgia, 72.6 million kilowatt-hours to Iran, 76.6 million kilowatt hours to Russia and 13.45 million kilowatt-hours to Turkey. The volume of import was 59.9 million kilowatt-hours from Russia, 24.4 million kilowatt-hours from Iran, and 23.1 million kilowatt-hours from Georgia. With the energy system of Azerbaijan, Russia, Georgia, Iran, and there is a high voltage line between the energy systems of Turkey. As a result of commissioning of 500 kV Samux - Gardabani HEVX in 2013, technical opportunities were created for the export of electricity from Azerbaijan to Georgia and Turkey through the Azerbaijan-Georgia-Turkey energy bridge, and in the future to the Black Sea and Eastern European countries. A contract was signed between Azerenerji OJSC and Iranian Electricity Generation, Transmission and Distribution Management Company (TAVANIR) for the purchase and sale of electric energy (in the island) for Iran's Mughan and Astara regions So far 48.3 million kilowatt-hours of electricity has been exported. At present, the second power transmission line 230 kV "Masalli" is under construction between the power systems

of Azerbaijan and Iran. "The obligations under the Agreement between the Government of the Republic of Azerbaijan and the Government of the Islamic Republic of Iran on the continuation of the construction, operation, construction and operation of hydropower stations and hydroelectric power stations" Khudaferin "and" Maiden Tower "on the River Araz on the Araz River are also fulfilled".

The work on the construction of the hydroelectric power station's hydroelectric power plant, culverts, energy trays, and irrigation water receiver and construction wastewater facilities was completed on the Khudaferin project: works on the Maiden Tower project have also started. Purchase and installation of energy blocks at both stations is planned. These hydropower plants with a capacity of more than 1.6 billion cubic meters and total capacity of 280 MW and average annual energy production of 766 million kilowatt-hours will provide joint use of both sides of the Araz River's water and energy resources. Negotiations on the construction of the second HEVX 330 kV "Absheron-Derbent" with Russia, as well as the establishment of the Russia-Azerbaijan-Iran electricity corridor are underway.¹³

Modern Azerbaijan confidently enforces national leader Heydar Aliyev's oil strategy, and these countries were able to ensure energy security only myself, but also its closest neighbors, European to consumers. It is Azerbaijan after long and unsuccessful negotiations with the EU took over responsibility and initiated the construction of the Southern Gas the corridor. «Our country is important, responsible and reliable. EU partner in energy security. However, European organizations are logically incompatible motivations limit the scope for broad cooperation with Azerbaijan. It should be noted that due to the gas supplied to the European market, Azerbaijan not only plans to increase its share, but also practically contributes to the implementation strategically important plan to diversify the communication network. It is in its kind of an early answer to the challenge of perspective. Because attempts look ridiculous and at least incomprehensible, some circles distance themselves from filling gaps in EU policy on energy. According to the calculations of the European Commission, the EU today imports 53% of produced oil and gas,

¹³ <https://report.az/energetika/son-11-ilde-azerbaycan-elektrik-enerjisi-idxalini-20-25-defe-azaldib/>

spending on it annually 400 billion euros. The European Union is the world's largest importer. On this basis, on February 25, 2015, the European Commission adopted a strategy for the creation of the «European Energy Community». One of the main activities Community is energy security, the basis of which is diversification of energy resources. As noted in the Energy Security Strategy Europe, adopted in 2014, the main priority is creation of the Southern Gas Corridor. The paper notes that for the first time gas will be imported from Azerbaijan. To receive access to new energy resources of the European Union has been negotiating with the Caspian countries for many years and countries of the Middle East. In the framework of the Southern Gas Corridor project, the EU supports gas pipelines such as Nabucco, TAP, ITGI. International consortia that have nominated these projects have expressed a desire import gas from Azerbaijan, but have not yet taken specific steps in this direction. To output gas to the European market needs to invest and build necessary pipelines.¹⁴

Uncertainties caused by political and financial problems make it difficult to make specific decisions for European companies in the issue of access to new resources. Despite to numerous discussions, the unsolved problem about investment in the Nabucco gas pipeline project is also associated with this a factor. In the conditions of indecision of consortia, Azerbaijan took initiative in their own hands, so that in 2011 the President Ilham Aliyev and Turkish Prime Minister Recep Tayyip Erdogan agreed on the implementation of the TANAP project. His successful implementation is a clear embodiment of decisive political will of two public officials.

Thus, Azerbaijan and Turkey, successfully coordinating actions make the South Caucasus region a strategic hub center that can guarantee uninterrupted operation of the most important energy corridor. On June 28, 2013, the ShahDeniz consortium accepted the historic the decision to transport gas to Europe the deposit of the same name, choosing as rational Trans Adriatic Route (TAP). Therefore, this solution gave new impetus to the idea of the European Union to ensure outlets to new energy resources.

¹⁴ https://azertag.az/store/files/RM_Azertag_SON.pdf

According to domestic and international experts, the most promising directions for the development of a “green economy” in the Republic of Azerbaijan (AR) are energy, transport and agriculture in recent years, numerous Studies examining the existing potential for the development of alternative and renewable energy. Because of research revealed the presence in the country large wind, solar and hydropower potential, biogas and thermal energy resources. In general, the level of opportunities for infrastructure development alternative and renewable energy of Azerbaijan can be correlated with such countries like Denmark and Germany Solar energy Climatic conditions of Azerbaijan allow producing electricity using solar energy. If in Russia, the number of solar makes up 500-2000 hours a year, then in Azerbaijan - 2000-2800. The use of solar energy could help solve problems related to power supply in some regions of Azerbaijan. Some developed countries in the world. In recent years, photovoltaic (PVP) has been widely introduced electrical energy by using photosensitive elements to conversion of solar energy into electricity). Azerbaijan’s use of these programs are also relevant.

It is known that the efficiency of solar installations depends on climatic conditions and the geographical location of the country. In Azerbaijan, the annual radiation of solar energy is 1500-2000 kW/m² (in the USA - 1500-2000 kW/m², in Russia - 800-1600 kW/m², in France - 1200-1400 kW/m², in China - 1800-2000 kW/m²). It speaks about enough high solar intensity in the country compared to other countries, which may to become a factor in attracting investment in order to use solar energy.

Table 3: Stocks of traditional, alternative and renewable energy sources in the Republic of Azerbaijan

Name of energy resources	Measuring unit	Location	Amount
Traditional sources of energy			
Oil	tons	Caspian Sea, Absheron peninsula	> 1.2 billion

Natural gas	m ³	Caspian Sea, Absheron peninsula	> 2 trillion
Brown coal	tons	Alazan-Ayrichay Hollow	20-25 million
Oil shale	tons	Quba, Ismaili and other areas	~ 100 million
Unconventional Energy Sources			
Wind	billion kWh. h	Country territory	> 2.5 ÷ 4 per year
Large hydroelectric power plants	billion kWh. h	Country territory	2.5 ÷ 3 per year
Small hydroelectric power plants	billion kWh h	Country territory	2.5 ÷ 3 per year
Solar energy	Here	Territory of the country	equivalent to more 100 thousand tons of oil
Thermal waters	Here	Territory of the country	Large quantities
Biomass	Here		Large quantities

Source: ¹⁵

The maximum values of the intensity of solar radiation on the horizontal and normal flat surfaces are achieved in summer and differ somewhat in different districts of the Republic: Pirallakhi Island (near the Absheron Peninsula), Mingechaur (northeast) and the Nakhichevan enclave between Armenia and Iran). Wind power. At the price, ecological purity and inexhaustibility of the resources wind energy exceeds solar, water, geothermal energy and use biomass.

¹⁵ http://www.energycharter.org/fileadmin/DocumentsMedia/IDEER/IDEER-Azerbaijan_2013_ru.pdf.

Studies show that many regions of Azerbaijan have large opportunities for wind applications. According to calculations, the annual potential the country's wind power is 800 MW¹⁶.

The Ministry of Ecology and Natural Resources pays special attention to the expansion relations with international organizations and donor countries to address environmental issues. Cooperation with UNDP, IAED, UNEP, NATO, OSCE, GEF, OECD, Economic Cooperation Organization, World Bank, the Asian Development Bank, the World Wildlife Fund and other organizations. In addition, bilateral relations are established with developed countries. based on relevant agreements. Bilateral agreements of Azerbaijan with other countries on cooperation in the field of environmental protection are listed in the application.

Accession to international conventions in the field of environmental protection Wednesday is also an important task for Azerbaijan. To this end, to the present time, the Republic of Azerbaijan signed 20 conventions, including the Convention on Convention on the Protection and Use of Trans boundary Watercourses International Lakes Convention on the Conservation of European Wildlife and habitats, the Basel Convention on the Control of

Transboundarytransport and disposal of hazardous wastes and the Convention on Evaluation environment in a trans boundary context.¹⁷

Three priority areas for the development of the energy sector of Azerbaijan include: "(1) the reconstruction of the power system to improve the quality of energy supply and reduce losses; (2) renewable energy development; and (3) boost energy efficiency and energy saving in the sphere of demand ".The main goal of the Government of Azerbaijan in the energy sector is to provide self-sufficiency in matters of meeting the demand for energy. For oil this the goal was achieved in 1998, on gas in 2007. In addition, in addition to already taken of export obligations, at present Azerbaijan has excess capacity in the amount of 2 billion m³ gas that could be supplied to Europe.¹⁸.

¹⁶ Интернет-журнал «НАУКОВЕДЕНИЕ» <http://naukovedenie.ru>

¹⁷ https://energycharter.org/fileadmin/DocumentsMedia/IDEER/IDEER-Azerbaijan_2013_ru.pdf

¹⁸ (Azerenerji, data base 2017)

The reconstruction of power plants can be considered as the main achievement in the field of energy efficiency in Azerbaijan. Although this is an important step, Azerbaijan should increase its focus on energy efficiency on the political agenda. Despite the fact that the introduction of energy efficiency measures is associated with difficulties activities in this direction should continue in view of the expected future benefits and risk reduction. The purpose of the in-depth review of the process under PEEREA is to assisting in these tasks. ¹⁹.

Favorable factor is that Azerbaijan has reached energy independence. This creates opportunities for channeling revenue to investments in RES and energy efficiency. In this regard, it is necessary to minimize local demand, maintain oil, and gas reserves for future expansion of export. These measures could be stimulated through consistent implementing energy efficiency policies. Improved performance this policy is supported by well-developed programs and measures energy efficiency, meeting the priorities of Azerbaijan.

Chapter 3. Long term effects of official Baku cooperation policy

3.1 Future vision and forecasts on global and national electricity system

3.1.1 Socio – economic impact of International energy cooperation in Azerbaijan

Azerbaijan gives extraordinary consideration to reciprocal relations with individual outside nations, which make a consistent solidarity with its multilateral relations, incorporating relations with neighboring nations.

It should be noted that the countries of Western Europe for Azerbaijan, the first to perceive

Relations with the Republic of Turkey, the first to perceive the autonomy of Azerbaijan and right up 'til today supporting our position, is of most extreme

¹⁹ State Agency on Alternative energy of Azerbaijan, data base 2017

significance. Respective relations between these two nations, which from an ethnic, social, etymological perspective are firmly connected to one another, are presently additionally extended and developed at the dimension of key participation. The frame of mind of Azerbaijan and Turkey to the advancement of geopolitical and monetary occasions occurring in the locale, the execution of trans territorial financial activities, just as official Ankara's endeavors to determine the Armenian-Azerbaijani clash, including measures taken inside different universal associations, exhibit full consistence with their positions and level nature of collaboration between the two countries.

Given Russia's solid impact in the South Caucasus, Azerbaijan's outside arrangement gives uncommon consideration toward the northern course, which is of extraordinary significance. Azerbaijan, which is endeavoring endeavors to decrease pressures and make a decent neighborly atmosphere in the district, is agreeable to additionally improving commonly advantageous collaboration with Russia in the financial, political, social and social circles. Because of such a productive position, one can talk about the positive patterns rising here, as a matter of first importance about the "weatherization" of relations, communicated in equal visits of the presidents, the understanding among Azerbaijan and Russia on isolating the Caspian Sea into national divisions, just as collaboration covers different territories, including the security of both parties.

One of the primary headings of Azerbaijan's outside strategy is relations among Azerbaijan and Iran, which have a rich basic legacy in the field of history and culture. From the main days of its freedom, Azerbaijan appended incredible significance to relations with Iran. Azerbaijan is attempting to reinforce commonly advantageous ties with Iran in the regions of governmental issues, economy and culture.

Comprehensive strengthening of collaboration and association with Georgia and Ukraine, which have comparative interests with Azerbaijan, is one of the fundamental noteworthy issues for our nation. The presence of normal premiums of Azerbaijan with these nations, the conveyance of hydro carbonate assets of the

Caspian Sea to world markets and the reclamation of the notable Silk Road for interfacing Europe with Asia, just as investment in joint trans-provincial undertakings, for example, guaranteeing shared certifications of basic security, by and by demonstrate the significance of these relations.

In the arrangement of outside relations of Azerbaijan, a noteworthy spot is involved by relations with the nations of Central Asia. Notwithstanding our normal chronicled and social roots, the increase of Central Asian states to ventures where Azerbaijan is one of the primary members added to the advancement of further close financial and political ties with these nations. One of the aftereffects of this arrangement is that Azerbaijan could turned into a solid scaffold for Central Asia to the European space and market.

Along with the abovementioned, relations with created Western nations that are not straightforwardly neighbors of Azerbaijan involve a standout amongst the most significant places in our outside strategy. Our nation joins extraordinary significance to relations with the United States. Azerbaijan, so as to fortify the capacity to ensure its security, regional respectability and autonomy, is keen on further building up these relations. Taking into account that the advancement of these relations fills in as a driving force for the financial and political advancement of Azerbaijan, the execution of the Caspian Sea oil and gas ventures and the production of a trans local hall associating the East with the West, the participation among Azerbaijan and the United States goes about as the fundamental component of our nation's mix into the worldwide monetary framework. The ongoing patterns saw on the planet, the rise of new dangers that are shaking worldwide security, have requested further fortifying of participation among Azerbaijan and the United States. Azerbaijan, being a significant partner of the United States in the district, keeps on building up these key relations.

Azerbaijan's relations with Western European nations are of specific significance. The advancement of these relations positively affects the usage of essential changes in the general population and private areas, just as on the formation of a cutting edge showcase economy and on drawing in remote venture. It ought to

be noticed that the nations of Western Europe for Azerbaijan act as the main export market.²⁰

The new world order was approved in the form of the spread of Western values, demonstrating the financial and commercial dependence of Western countries and the well-being of European citizens. The Europeans were convinced of the universality of their values, that economic interdependence and a common lifestyle would become the dominant source of security in the world of the future.

Being in the euphoria of their own innovations, the West, in a certain sense, has lost touch with reality and saw only what other states correspond to European standards, instead of trying to understand other systems of ideas. And the claim of a new European idea at the same time of exclusivity and universality made it impossible for Europeans to accept alternative integration projects on the continent.

The main reason for the emergence of such a complex and tense situation in the world, in the opinion of many analysts, is the open desire of the leading world powers to realize their own interests, disregarding neither the norms nor the principles of international law, which could not but lead to a serious crisis in relations between Russia and the West. Not the last role in this issue was played by the events in Ukraine and the subsequent steps of the West, which introduced large-scale sanctions against Russia.

All this gave reason to talk about the collapse of the post-bipolar world order and the beginning of the new “cold war”.

Today, before our eyes, violent processes are taking place, accompanied by serious changes in the world order. Some states are losing their former power and new power centers appear, whose influence extends to vast areas. The so-called “color revolutions”, “the Arab spring”, numerous local conflicts lead to the redrawing of the geopolitical map of the world.

In the acute geopolitical confrontation that began immediately after the end of the “cold war”, the political elite of the Western countries made the main priority the weakening of Russia on the world stage and its subordination to its strategic

²⁰ Department database of the State Agency on Alternative Energy

interests. Against the background of the geopolitical confrontation, the western partners of Russia, and above all the United States, did not realize that excessive weakening of the former adversary does not necessarily give a win, but can cause a sharply negative reaction and create even greater threat than came from the former opponent.

The United States, acting unilaterally and arbitrarily using coercive actions in a number of regions, provoked an unprecedented rise in anti-American sentiment throughout the world. Ultimately, the United States inevitably had to meet the cohesive resistance of other states, regardless of the size of their economic and military power. In this connection, it is not by chance that the warning of the famous American politician Henry Kissinger, who stated that "nothing more threatens the established world order and stability of American society than the hegemony of the United States" warns.

In this regard, the publication of the two-volume edition "Introduction to Geopolitics", authored by former Deputy Head of the Presidential Administration of Azerbaijan, head of the external relations department Mr. Novruz Mamedov, was an important event in the socio-political life of the country. The book is one of the first editions in Azerbaijani language devoted to a comprehensive study of geopolitics as a field of knowledge and the object of its research - the geopolitical structure of the world.

The author dedicated his work to the blessed memory of Heydar Aliyev, the founder of the modern Azerbaijani state. In addition, this is quite natural, given the enormous role that the national leader played in the emergence of a new geopolitical situation in our region, turning Azerbaijan into a power center in the entire Caucasus, its influence on the processes that took place in the world at the end of the past - the beginning of this century.

"Revolutionary changes in society and a radical transformation of the geopolitical structure of the world require a "new discovery of geopolitics," writes Mr. Novruz Mamedov in the author's introduction to the two-volume book. According to him, geopolitics occupies an important place in modern international

relations. “Without geopolitical forecasts, the future of the country cannot be imagined. In a multipolar world characterized by the existence of open and closed societies and economies, a public official must have geopolitical thinking. ”

In the first volume, modern geopolitical theories and schools are analyzed in detail, including modern atlantism, mondialism, and new Eurasianism, and the geopolitical teachings of the postmodern era are covered.

The second volume is devoted to modern geopolitical processes. Here, special attention is paid to the geopolitics of the United States, Europe, Russia, China, India, Japan and Muslim states. The book analyzes the modern world order, the main geopolitical events taking place in the world, gives a geopolitical characteristic of the planet, examines in detail the geopolitical power centers and relations between them, new views on geopolitical issues in a globalizing world, the struggle of states for their national interests, the growing role of international organizations and financial institutions at the present stage of development, existing threats and challenges to humanity, issues of economic, political, energy security allegiance.

Thus, the end of the “cold war” did not unite the former opponents. The attempts to transfer the decision-making center to the sites of various European regional organizations did not produce results either. Instead, appeals and appeals began to sound from the stands of these structures, more reminiscent of the teachings and tone of a strict teacher. In fact, practice has shown that the emerged crises and conflicts, including the Ukrainian one, have not been able to effectively solve any of the existing organizations that are called upon to resolve such situations. The source of serious problems in relations between Russia and the West was the decision of NATO to expand its borders, as well as Russia's response to a threat to its own interests.

3.1.2 Forecasts on electricity transmission of Azerbaijan till 2050

Target view for the period after 2025 is electricity, water, efficiency, and efficiency of sewage, heat and natural gas supply sectors to achieve a full level of service.

Description of the target focus

Electricity production in the Republic of Azerbaijan is abolished by defining ineffective activities throughout the full value chain up to consumption, efforts will be made to eliminate them. To achieve these goals electricity generation, transmission, distribution and retail services in the country in the post-2025 period from the point of view of governance the establishment of a fully independent environment envisaging separation will be seen. Each of these destinations will be optimized efforts will make it possible to maximize the value chain in the country. That is it the efforts to attract more foreign direct investment and the sector into the sector in each of the four components, in coincidence with the application of "know-how" falls ²¹.

Electricity in the Republic of Azerbaijan until the 2050 increasing the attractiveness of the sector, value chain effectiveness, ecology measures to ensure sustainability, rational competitiveness and cost effective tariffs will be seen. The measures to be taken to account for households, commercial and providing quality and uninterrupted access to electricity to industrial consumers will be made.

Natural gas, water and renewable energy sources to boost power supplies in the country investment in energy production from energy sources (eg sun and wind) contributions will be made. In the production portfolio of natural gas-power stations although their share in the total portfolios is 2025 will be reduced in the subsequent period. From this point of view, medium and long-term sustainable energy production in terms of renewable energy strategy will be targeted. One of the production power in the Republic of Azerbaijan at the expense of renewable energy sources till the 2050 and is intended to intensify the construction of these stations it is motivated. Invest in wind and solar energy to achieve this goal In addition to their contributions, other renewable energy, such as geothermal and biomass potential

²¹ http://www.azerenerji.gov.az/files/2016_12_30_12_05_50_0f3c.pdf

resources in their sources. Your industry liberalization will play a crucial role in achieving this goal. Thus, the "Tick-Control" model, like stimulating tariffs and auctions electricity using renewable energy sources will directly stimulate private sector involvement in the operation of its power plants.

Industrial areas and certain layers of the population in the Republic of Azerbaijan application of electric panels with small production capacity (on the roof of buildings In addition to the built-in solar panels, natural gas, heat and electricity power stations and small-scale wind turbines) planned. Especially, outside of Baku, more than the electricity infrastructure sun-mounted solar panels in regions where there is potential for improvement there are opportunities to improve the situation with the application of energy panels. Installation and installation of solar panels installation their widely used, given their low cost. At the same time, the overall production of natural gas enterprises electricity will be utilized to improve its efficiency.²²

In the national portfolio of the Republic of Azerbaijan after 2025 bringing the energy efficiency to the highest level targeted. This goal consists of two components:

- All existing natural gas and water based power generation facilities full modernization;
- New production facilities with the highest efficiency (natural gas, electricity, water, wind and solar energy) application.

Electricity transmission and distribution process in the Republic of Azerbaijan two key objectives for the long-term perspective are set out:

1. Available at power transmission and distribution for the post-2025 period commercial and technical losses are comparable to the European countries to bring it to the level;
2. Using electricity from the experience of advanced countries eliminate existing deficiencies in the sector.

To achieve these goals, the infrastructure will be completely modernized, old equipment and fixtures are replaced with the most up-to-date equipment and fixtures

²² http://www.azerenerji.gov.az/files/2016_12_30_12_05_50_0f3c.pdf

(for example, the share of high ground underground cables in the public network increase). Electricity transmission and distribution lines later has been encrypted through communication channels for remote monitoring and control Signal-operated control and information system (SCADA system) will be made. The SCADA system is able to monitor possible interference or loss and will improve the overall quality and effectiveness of the network. At the same time, with the retail component of the electricity sector two important objectives are prioritized:

- Europe's energy efficiency levels in industry and commerce reach - different state energy efficiency methodologies in both areas (for example, buildings that effectively use energy and promotion of products);
- Required for the use of electric motors infrastructure construction - with electric motor in the country since 2020 it is expected that the car will be used. In the Republic of Azerbaijan, a prerequisite for creating a fully formed electricity infrastructure as it is considered.

Loss of gas in Baku is reduced by Europe in gas supply it is envisaged to deliver comparable losses in gas distribution. Gas In the existing gas distribution system, in addition to losses occurring during distribution efficient operation with the use of meters by all users during that period will be fully provided. It is effective on the network based on more information as well as to achieve an increase in harvesting levels.

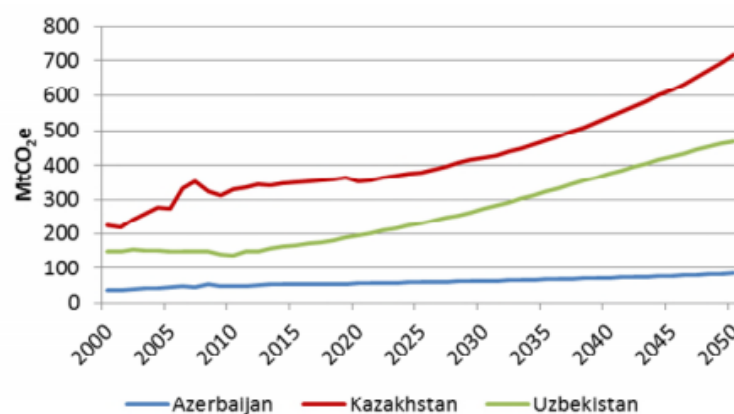
The Asian Development Bank (ADB) is a global warming-powered investor in Azerbaijan, Kazakhstan, and Uzbekistan. Information on possible options and costs for reducing emissions (GHG) emissions Regional Technical Assistance (RETA) 8119 - Climate in Central and West Asia Developed the Economic Aspects of Changes - Impact Mitigation Component Project prepared. Intensity of EWC in the energy and transport sectors of the mentioned countries there are significant opportunities to increase.

The results of the models created across countries show that thanks to the growth in population and income increased demand for carbon-containing energy in

2050, in all three countries, particularly in Kazakhstan and will lead to an increase in the emissions of EALs in Uzbekistan (Figure). Incomes and As economic activity increases, people get more cars, more homes and businesses consumes more energy to meet increased demand for products and services. Azerbaijan, Kazakhstan and Uzbekistan's energy and transportation systems are now intensively carbonated emissions, and then a significant increase in the EMI emission will occur.²³

However, this situation itself creates new opportunities resources and reconsideration of energy options and less climate-based development implementation of green growth strategies. Efficient clean energy from expense technology, as well as new fuel types and low carbon emissions the use of vehicles may play an important role in achieving these goals. These approaches correct assessment of potential impact mitigation measures will give impetus to the process of attracting public and private investments. Figure does not take any significant steps to reduce emissions and all three mainly in the energy and transport sectors of the country (Azerbaijan, Kazakhstan and Uzbekistan) FDI emissions are predicted if there is a dependency on the traditional fuel economy condition (Figure 3).

Figure 3. The amount of emissions in three countries



Source: (Stokholm Ətraf Mühit İnstitutu və Abt Associates (2015a; 2015b; 2015c))

²³ Texniki Yardım üzrə Hesabatı ; Layihənin nömrəsi: 44068-012

Carbon emissions in Azerbaijan between 2010 and 2050 Up to 78% in Kazakhstan and 118% in Kazakhstan and 243% in Uzbekistan projected. These increases are rational use, fuel replacement and other means reduction measures.

Conclusion

This research is the concept of energy security within a specially selected country an attempt to adapt to the diversity of stakeholders and conceptual and methodological level energy security definition, energy security talks and energy in fact, the participation of non-state actors in the perception of security to eliminate the lack of stakeholders in the background of these subjects diversity is an increasingly important factor in ensuring energy security is converted. This research work focuses on bilateral energy relations, and, first of all, governance existing between the EU and Azerbaijan in the state / society relations contribution to eliminate asymmetry. These asymmetries are these two sides the diverse legitimacy of the management and the transparency of the producer country accountability deficits. This initial research, from below - to the top and suggested that the approach be lower starting with the concept of energy security, a country in the chain of energy trade depending on its role, and also by non-state actors and their contributions to energy security. This research job, producing energy five perceptions of the energy security of different stakeholders in the country focuses on assessment based

analysis. As an initial step, Azerbaijan's energy identified stakeholders and various stakeholders interviews with people representing the group.

This research has shown that resource opportunities for Azerbaijan are at the forefront does not create anxiety, but by developing alternative energy sources diversity, and long-term use of oil revenues energy security can be guaranteed. The most exciting thing is the energy produced the country's economy depends on the hydrocarbon reserves and the country is such it is defenseless from external shocks and this is dramatic in recent years. The economic crisis and the depreciation of the manat were proven that so far the government could not effectively use the oil coming and either in agriculture or in the field of alternative energy no progress. On the other hand, any regional stability and security In the event of danger, uninterrupted supply can be subject to serious threats, and that is governments and oil companies. Experts, state and energy security by corporations across the country as well as regional at the same time as part of the preparation for stability / pre-exploitation. Stable security is primarily a major consumer in the domestic market is a definition of power and energy belonging to civil-consumers and industry representatives. The increased price of electricity is directly affecting consumers.

This research is an attempt to remind you of the ultimate goal of energy security - all energy supplying oil and gas to medium-sized citizens in countries with resources. Open questions and approach from bottom to top are key to energy security beneficiaries - to expose the ideas of ordinary consumers and families in the country gave. This approach is a broad geography of energy relations between the West and the East analysis and can be used as a useful tool for energy security humanitarian dimension and social and political problems when assessing threats increase awareness.

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