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Sustainability on Energy Governance: Recent Trends of the Electricity Sector in Azerbaijan

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Our aim is to analyze sustainability on energy governance, recent trends of the electricity sector in Azerbaijan, in particular, the degree of efficiency of the electricity system and the tariff structure to give recommendations for future development and perspectives of energy sector development in Azerbaijan. We argue that government policy should be oriented towards identification of those factors that seek energy efficiency for sustainable development, uncover several laws, ensuring energy security, and encourage electricity market. Besides that by comparing electricity tariffs in Azerbaijan with some other European countries, we find advantages in the Azerbaijan-EU partnership on the energy field, thus we propose appropriate forms of cooperation regarding to European Neighborhood Policy.

Keywords: sustainable development, energy, Azerbaijan, regulatory authority, electricity sector, transmission, distribution, tariffs, generation

Introduction

The main objective of the Azerbaijani Government in the energy sector has been to become self-sufficient in terms of meeting the energy demand. This objective has been achieved for oil since 1998 and for gas and electricity since 2007. Moreover, in addition to traditional fossil fuels exports, there is also currently potential of renewable energy deployment especially of wind power and solar photovoltaic energy. According to Action Plan 2011-2015, approved for the implementation of the State Program on Poverty Reduction and Sustainable Development (2008-2015, 2015-2030), the country begins liberalization of enterprises in the fuel and energy sector. Liberalization of some projects in energy fields could bring a synchronized development of small and medium-sized enterprises (SME). Especially the electricity sector which ensures the energy security of the country becomes more important for improvement. Substantial measures were taken for the formation of legislative basis in the power engineering sector, and improvement of legal basis concerning this field. Several laws were passed on power engineering, including the law on “Power Engineering”, “The Use of Energy

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Resources", "Electrical Power Engineering", and "Electric and Thermal stations". Azerbaijan becomes a regional leader in managing the energy system and raises its export and transit potential in this field. A short-term target should be to prevent wasting natural resources and to develop an alternative, renewable energy for internal needs.[1] Baku city and its provisions mostly located on the coast could be supplied with wind and solar photovoltaic energy set using innovative solar heating system in all residential buildings and industrial constructions.

A significant feature is that today, Azerbaijan does not depend on foreign resources in the energy sector. Thus, it is a privileged starting point for sustainable development. It provides 100% of its gross energy consumption through domestic production, which is currently largely reliant on the exploitation of the country's hydrocarbon reserves. On the other hand, Azerbaijan cannot depend solely on its energy sector. It must promote sectors as well to build a robust economy for the future. Over the last years, Azerbaijan has successfully identified political development and administrative reform as national priorities in order to increase economic growth, alleviate poverty, and decrease unemployment. Azerbaijan has significantly improved its performance and competitiveness in the economy. It is currently the best result among the Commonwealth of Independent States (CIS) countries, ranking 39th among 140 countries (Ahmadov, 2013, p. 259). The European Union (EU) has endorsed these national development plans of the Government of Azerbaijan and is currently supporting their implementation through the European Neighborhood Policy.

The paper is structured as follows. Section 2 presents Azerbaijan-EU cooperation on energy sector. Section 3 explains the institutional structure of Azerbaijan electricity system and the prospects for liberalization. Section 4 discusses how electricity prices are currently set by the Tariff Council in Azerbaijan and compare the prices with other EU countries. Sections 5 and 6 focus on the electricity structure. In those sections, we present power generation capacity and production, the electricity consumption, and dynamics of export and import in Azerbaijan. Also, this part of the paper involves electricity energy implemented joint projects and nuclear research in Azerbaijan. We discuss the projects which took part on electric power transmission system and we also analyze the interconnections of Azerbaijan with neighboring countries. We conclude the paper in Section 7 with policy recommendations.

Further Development on Energy Market Cooperation With EU

Azerbaijan gives great importance to developing relations with EU and looks forward to a mutually beneficial relationship that suits both parts. Azerbaijan and EU have achieved many successful projects. Geopolitically, Azerbaijan plays an important role cause of its geographical location on energy supply and transportation. Besides, Azerbaijan's present agenda includes the Partnership and Cooperation Agreement (PCA) of 1999 to reinforce the existing cooperation with EU in several sectors. According to the National Indicative Program (NIP) for 2007-2010, the assistance provided is supposed to concentrate on reforming energy legislation and on opening the energy market. One of the main areas of co-operation between Azerbaijan and the EU is the "dialogue on energy".

The major objectives of the Memorandum between EU and Azerbaijan included the diversification and security of the EU's energy supply, as well as the development and modernization of Azerbaijan's energy infrastructure (Memorandum of Understanding,2006). Besides, four priority areas of cooperation have been

[1] Especially in Absheron peninsula (coast of Caspian Sea where is located capital city Baku) where annual sunny and windy days prevail.

identified: harmonisation of legislation, enhancing security of supply and transit systems, development of renewable energy sources and increased energy efficiency, and technical cooperation. Moreover, further development on energy market cooperation between Azerbaijan and EU related to the Southern Gas Corridor. The recent transit gas agreements signed between Azerbaijan and Turkey and follow-up agreement on construction of the Trans Anatolian Pipeline (TANAP) have brought the southern corridor close to its realization.

The State Oil Company of Azerbaijan (SOCAR) is responsible of production, it operates the country's two refineries, it runs the country's pipeline system, and it manages the country's oil and natural gas imports and exports. SOCAR produces less than 20 percent of Azerbaijan's total output, with the remaining 80 percent being produced by the BP-operated Azerbaijan International Operating Company (AIOC). This is a consortium of 10 mostly foreign petroleum companies that have signed extraction contracts with Azerbaijan.

SOCAR is the largest investor in Turkey's economy. The total investment portfolio of SOCAR in Turkey amounts to $20 billion (Azernews, November 2015). Turkey has become one of the biggest economies around Europe and in the world over the last 30 years with rapid increase in its population and industrialization (Baris & Kucukali, 2012, p. 386).

In addition to reforms in the oil and natural gas sectors, new reforms in the electricity sector are being implemented to diversify technology mix which is currently based on oil and gas generation. The target is to increase exports of fossil fuels without electricity shortcuts. Azerbaijan strategically connects not just with neighboring energy markets but also with EU energy market through a customs union of Turkey and EU. Azerbaijan also develops partnership with EU in electricity sphere by INOGATE regional energy cooperation. INOGATE is a regional energy cooperation program between the European Union and 11 partner countries in Eastern Europe, Caucasus, and Central Asia. The EU-funded INOGATE Technical Secretariat Project is to provide EU technical assistance aiming to facilitate the future development of a regional electricity market in the southern Caucasus. The INOGATE Technical Secretariat conducts a dialogue with Azerenerji JSC (Azerbaijan), Georgian State Electro System JSC (Georgia), and Turkish Electricity Transmission Company TEIAS (Turkey as an observer) in order to provide practical guidance for the further development and standardization of planning functions, as well as for legal and regulatory requirements for cross border trading.

The European Commission and the International Energy Agency (IEA) launched in April 2015 a new compendium publication which was prepared with the support of the INOGATE Technical Secretariat. This dialogue is expected to result in a roadmap for the future organization and operation of the southern Caucasus electricity market agreed by the three parties.

Azerbaijan also develops relations with EU under the "European Union-Azerbaijan Action Plan", which was concluded as part of the European Neighborhood Policy; Azerbaijan is to continue co-operation on Caspian and Black Sea regional energy issues and enables the infrastructure to facilitate the transit and development of Caspian energy resources. Within the energy and transport priority area of the action plan, there are specific commitments to energy policy convergence towards EU energy policy objectives, which are expressed as: Gradual convergence towards the principles of the EU internal electricity and gas markets. The second is progress regarding energy networks (EEAS)[2]. Of particular relevance to this review is the commitment to progress on energy efficiency (EE) and the use of renewable energy strategy (RES). According

[2] European External Action Service (EEAS), EU/Azerbaijan Action Plan, http://eeas.europa.eu/index_en.htm.

to Action Plan 2011-2015, the implementation of the State Program on Poverty Reduction and Sustainable Development 2008-2015, the Azerbaijan began privatization of enterprises in the fuel and energy sector.

Institutional Structure and Legislation

The Ministry of Energy (MIE) is the central executive authority implementing state policy and regulation for the energy sector. Regulatory policy is implemented primarily by the MIE, and also by the Ministry of Economy and Industry and the Tariff Council. The MIE is largely responsible for implementing the various regulations, orders, and decrees issued by the government. The MIE has a board, approved by the Cabinet of Ministers, and has authority to issue orders and decrees within its area of competence. Such competence extends to most areas within the energy sector, but not to tariff regulation, which is within the area of competence of the energy regulator, the Tariff Council.

The Tariff Council acts pursuant to authority granted to it by Presidential Decree (26 December 2005), the Regulations on the Tariff (Pricing) Council, and the Resolution by the Cabinet of Ministers (9 March 2006). The Tariff Council establishes the tariff methodology, approves the tariff level proposed by regulated companies (including but not limited to energy), proposes changes to the legal framework as it relates to pricing, and settles disputes regarding price regulation and tariff application. It may act upon its own initiative within its tariff jurisdiction. The Tariff Council has a chairman and 12 additional council members who serve in a council not a staff capacity. The chairperson is the Minister of Economic Development and the 12 council members are deputy ministers (10 members) and deputy heads of committees (two members). In the event that the president, pursuant to a decree, replaces the minister and deputy heads of ministries and committees, that decree automatically replaces the council chairperson and council members. There are no fixed terms, with the chairman and members serving for the duration of their appointment by the president.

The main legislative acts regulating the power sector are the Energy Resources Law, dated 30 March 1996, the Law on Electrical Energy (the Electricity Law), dated 13 June 1998, and the Law on Electricity and Heat Power Stations (the Power Station Law), dated 28 December 1999. To satisfy the public's need for electricity and gas, the government adopted the State Program on the Development of Fuel-Energetic Complex of Azerbaijan (2005-2015)[3]. To address the growing global concerns over air-polluting emissions, in 2004, the president approved the "State Program on the Use of Alternative and Renewable Energy Sources in Azerbaijan Republic". Till the 2020, it is expected to increase alternative and nuclear energy percentage of total energy use in Azerbaijan.

According to the Electricity Law, the energy system of the Azerbaijan Republic should make provision for the following. The State Electrical Enterprise operates transmission lines of more than 110 kV, dispatching centers and energy production enterprises; secondly, the State Electrical Enterprise purchases energy produced by independent energy producers for its transportation through the transmission network, and conducts interstate energy exchanges; thirdly, energy suppliers purchase electricity from the State Electrical Enterprise or other independent energy producers and sell it to consumers; and finally, independent energy producers are economically and organizationally independent legal entities and are not part of the common state electrical energy system. These producers generate energy and supply it to consumers directly through their own distribution networks or via the State Electrical Enterprise or energy suppliers. These entities may also export their power.

[3] State program on development of fuel-energy sector in Azerbaijan Republic (in 2005-2015 years) (in Azerbaijan language). Retrieved from http://www.azenerji.com/az/powersystem/law/Dovlet_enerji_proqrami.pdf.

The main objectives of state regulation of tariffs for electricity are ensuring energy security of the country, maintain a reliable power supply to consumers, and set tariffs at a level that ensures the interests of consumers and producers of electricity, to favor investment in power generation facilities and develop interconnections. Moreover, to ensure direct state regulation of prices (tariffs), pricing is authorized by the Government of a public authority and establishes methods for calculating tariffs to order their approval and to which all regulatory authorities and businesses. In this way, it can reduce prices, tariffs, and losses, and establish free market and private power plants, improving the quality of service and improving competitive conditions. Besides that adapting to Europe standards, harmonization of legislative framework to the Directive and the Regulation of the European Parliament legislative framework and project implementation on transmission and distribution are the tasks set to the government. Besides these regulatory factors, there are many organizational and behavioral factors that influence the choices of project developers (Luthi & Prassler, 2011, p. 4878). In Section 4, we discuss the tariff system in more detail.

Figure 1 presents the electricity sector results of Azerbaijan, in accordance with the benchmarks and indicators identified in the assessment model. The extremity of each axis represents an optimum score of 1.0, that is, full compliance with international best practices. The fuller the "web", the closer the overall electricity regulatory framework approximates international best practices. The results for Azerbaijan are represented by the dark color line.

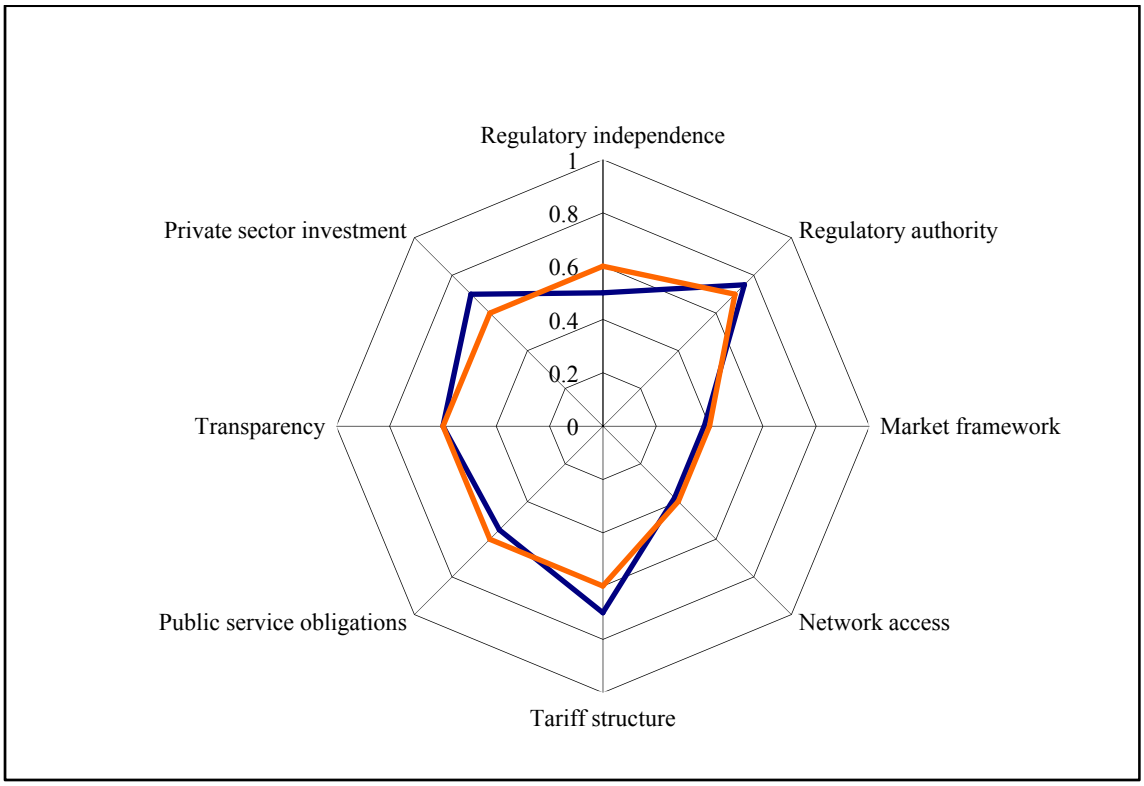

Figure 1. Electricity spider graph of Azerbaijan (Source: Own construction according to data of European Bank for Reconstruction and Development, Group C Countries Report, 2010, p. 197, and in-depth review of the Energy Efficiency Policy of Azerbaijan. Energy Charter Secretariat, 2013, Brussels, pp. 50-66).

For comparison purposes, the light color line presents the electricity sector average of the Group C countries (EBRD, 2009).

Substantial measures were taken for the formation of legislative basis in the power engineering sector, and improvement of legal basis concerning this field. Several laws were passed on power engineering, including the law on "Power Engineering", "The Use of Energy Resources", "Electrical Power Engineering", "Electric and Thermal stations", etc.

The Electricity Law requires that individuals and legal entities obtain special permission for conducting activities in the generation, transportation, and distribution of electricity if not otherwise determined by law. As a general rule, special permission to carry out activities in the power sector is granted, and the contractors determined on a competitive basis. The law provides that in certain cases, permission may be issued without a tender on the decision of the MIE. The Electricity Law also provides that high-voltage installations cannot be constructed and put into operation without prior special permission unless otherwise provided by law.

Electricity Prices

The regulated entities are required to provide economic justification for the expenses which make up part of prices (tariffs).[4] The calculated tariffs are reviewed by the Tariff Council and published upon approval. A uniform tariff for the residential use and other tariffs for commercial and industrial enterprises are in force. In legal terms, foreign capital investment in energy assets/companies is permitted and not restricted. Investments in new generating capacities are encouraged, and long-term electricity procurement is guaranteed.

The government has established a medium-term tariff policy that incorporates a transition to full cost recovery for utility service providers with a 10% return on equity. This will enable the utilities to become financially self-sustaining. The Tariff Council chaired by the Minister of Economic Development determines the retail and wholesale tariffs as well as the gas and fuel supply prices. The Tariff Council has powers to set tariffs for any kind of renewable energy, but only wind energy and mini hydro power tariffs have been set. There is no difference in tariffs between cogeneration and traditional power systems. At present, a uniform tariff is applied. The Ministry of Economy of Azerbaijan informed about ongoing discussion in the Tariff Council concerning possible adoption of support schemes (such as feed-in tariffs and feed-in premiums) for the development of renewable energy sector.

The regulated entities are required to provide economic substantiation of the expenses that are part of prices (tariffs). The calculated tariffs are reviewed by the Tariff Council and published upon approval. A uniform tariff for the population and other tariffs for commercial and industrial enterprises are in force. The following types of tariffs exist in the electricity sector: tariffs for the purchase of electricity from producers; wholesale electricity sale tariffs; retail electricity sale tariffs; and export and import electricity tariffs.

Tariffs are calculated on a cost-benefit basis, using reports for previous years and actual data, as well as forecasted data, taking into account estimations by the utility companies. Table 1 reports tariffs for electric power and services including wholesale, retail rates, and tariffs for consumers day time and night time

As a way of comparison, Figure 2 shows the end-user price of electricity in 15 European countries for the years 2012-2016.

Figure 2 shows that the average prices in Europe Union are three times more than the prices in Azerbaijan. Azerbaijan has tariffs which are much lower than those in EU countries. This is the combination of several

[4] The Tariff (Price) Council of Azerbaijan Republic, http://www.tariffcouncil.gov.az/?/az/content/44/.

factors, such as lower income and industrial activity, subsidies, and resource abundance. It is the target of liberalization to set prices that reflect the real cost of generation.

Table 1

Tariffs of Electric Power (Manat [AZN],[5] Euro)

	The name of services	Tariffs for 1 kVt/h (VAT included)	
I.	Wholesale rates		
1.2.	Power of Azerenerji JSC	5.7 AZN	(3) EUR
1.3.	Private production of small hydro power plants	5.0 AZN	(2.6) EUR
1.4.	Wind power stations	5.5 AZN	(2.9) EUR
II.	Retail rates		
2.1.	For all consumers (monthly consumption up to 300 kVt)	7.0 AZN	(3.6) EUR
2.2	With a monthly consumption of more than 300 kW	11.0 AZN	(5.8) EUR
III.	Transit transmission tariffs		
3.1.	Electricity transmission	0.2 AZN	(0.11) EUR
IV.	Carried out directly on the power supply lines 35 and 110 square meters, which is stable demand for trucks per day, chemical and aluminum industry, mining based production of steel melting that the average energy consumption for the purposes of producing is not less than five million kW/h		
4.1.	Time of day (morning till 08:00-22:00)	5.8 AZN	3.1 EUR
4.2.	Night time (from 22:00 till 08:00)	2.8 AZN	1.75 EUR

Note. Source: Own construction according to data of Decision No. 17 of the Tariffs (Price) council of Azerbaijan Republic, http://www.tariff.gov.az//?/az/content/70/.

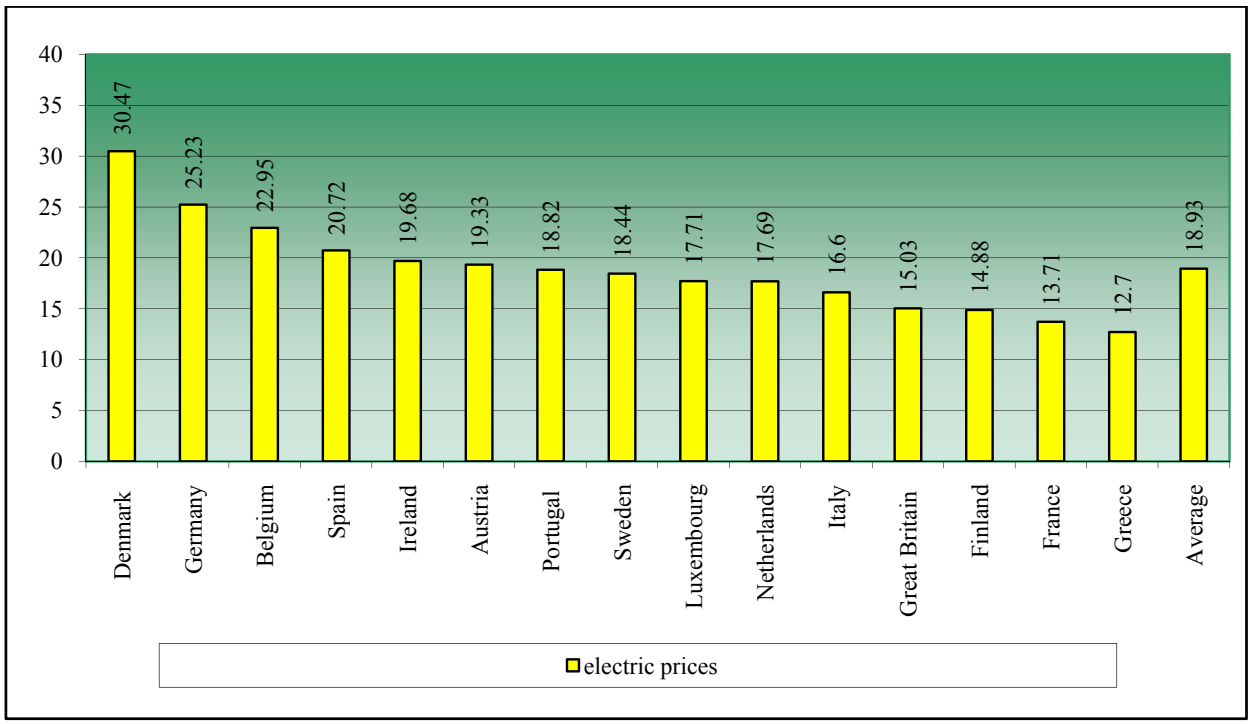

Figure 2. Average residential electricity prices including taxes, price in Euro-kWh (Source: Own construction according to data HEPI, Energy Control Austria and Vaasa ETT, 2012, p. 11).

[5] Central Bank of the Republic of Azerbaijan, 1 Euro = 1.91 AZN (2015), http://en.cbar.az/pages/national-currency/banknotes/azn/.

Electricity System

Power Generation Capacity

The power sector, along with the oil and gas sectors, has a leading role in the economy of Azerbaijan. Its importance is strengthening energy efficiency and enriching the development of energy network in Azerbaijan economy. Azerbaijan is fully electrified, and electrical power is the third most utilized energy source (the first is natural gas and the second is oil) for domestic and industrial use. The sustainable development of the power sector is a top policy priority for the government. Table 2 reports the evolution of the installed capacity and generation of electricity from 1995 until 2013 in Azerbaijan.

Table 2

Electricity Generation Capacity (MWt) (1995-2013)

Years	The capacity of power plants at the end of the year (MWt)	TPP generation	HPS generation
1995	5,044	4,256	787.7
2000	4,912	3,990	921.9
2005	5,157	4,187	970.1
2010	6,396	5,401	995
2013	7,310	6,227	1,083
2015	7,806	6,652	1,103
2016	7,910	6,726	1,105
2017	7,941	6,748	1,106

Note. Source: own construction according to data of the State Statistical Committee of the Republic of Azerbaijan http://www.stat.gov.az/source/balance_fuel/.

Azerbaijan's electricity sector is dominated by a vertically integrated company, Azerenergy JSC, which is a 100% state-owned enterprise. Azerenergy was established by Executive Order of the President No. 423 of 17 June 1996. It is the largest electrical power producer in Azerbaijan. Azerenergy JSC produces, transports, distributes, and sells electricity throughout the whole country, except in the city of Baku where the electricity distribution is performed by Bakuelektrikshebeke (Bakuelectricnetwork) SC. Azerenergy is entitled to submit proposals on tariff increases and to take part in the tariff regulation process, but the final authority with regard to tariff determination in the electricity sector lies with the Tariff Council.

Azerenergy owns over 200 substations as well as 14 hydro power plants and 13 thermal power plants. Much attention should be paid to the issues of renovation and replacement of the outdated generating capacities of the power transmission system. The important aspect of the problem is close location of the utilities and the consumers to the generating capacities with a view to avoid loss in the energy system. Construction of some new power plants and substations and capital repair of available facilities are planned in the future.

Majority of Azerenergy electrical generation is done at thermal power plants where fossil fuels, mostly heavy fuel oil and natural gas, are used to power steam turbines or gas turbines. Coal powered generation ceased in 1991. Azerenergy has neither nuclear power nor geothermal generating capacity. Hydropower is for now the most important renewable energy (RE) resource in Azerbaijan and in 2010, hydropower satisfied about 18% of the need for electricity generation. Azerbaijan has about 1,000 MW of operating hydropower capacity and an additional 62 MW of planned hydropower capacity.[6]

[6] The largest Hydro Power Plant "Mingechevir" in Mingachevir city on the Kura River, renovated in 2001, 360 MW; some of the Hydro Power Plants reconstruction are completed, many of them is under construction and some of them in need of reconstruction.

Although there has been little implementation of wind energy in Azerbaijan until the present day, interest has been growing. Its use has huge prospects in some regions of Azerbaijan. Calculations suggest that in Azerbaijan, the economically feasible potential is to produce about 800 MW of wind power. There are already planned projects of wind energy (see Figure 3). The main potential is in the southeast around the Caspian coast. Wind turbines are one of the most technologically viable and cost-effective options (Morthorst & Chandler, 2004). However, land-use planning challenges pose a significant barrier to the further development of on-shore wind energy in many countries. When making determinations on new wind energy project applications, local planning authorities must balance the needs and views of the local public with the broader national targets and guidance for renewable energy development (Loring, 2007, p. 2648).

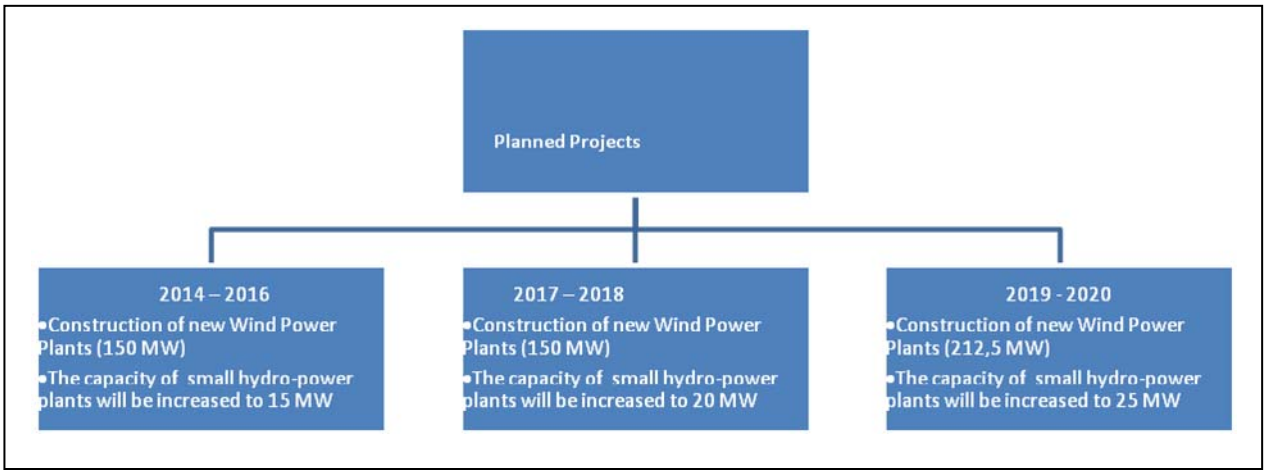

Figure 3. Planning projects by the years 2014-2020 (Source: Own construction according to data of State Agency on Alternative and Renewable Energy Sources [SAARES], http://area.gov.az/).

The estimates of the solar, biomass, and geothermal potential are more uncertain. Even though there is sufficient space to install solar panels, the estimated potential of 5,000 MW can only be a long-term goal due to the relatively high upfront investment cost. Biomass utilization is equally unlikely without an incentive system in place. There exists only the potential of geothermal energy for heat supply, due to the relatively low temperatures of the wells.

The main barrier to RES development is the low tariffs with 3.2 US$/kWh for small hydropower plants (HPPs) and 5.7 US$/kWh for wind. Another barrier is the lack of a legal basis for connection rules (Energy Charter Secretariat, 2013, Brussels). In order to overcome the barriers to developing RES in Azerbaijan, two projects are relevant. The preparation and implementation of an action plan for RE and EE. This project will be undertaken by the Khazar Consulting Agency (USAID, 2013). The second is the improvement of legislation in the field of RE and EE, and compliance with the law of the European Union. This project is ongoing on the part of SAARES in co-operation with the International Academy of Ecoenergy. Azerbaijan is interested in finding solutions to the problems regarding environmental protection and the rational utilisation of natural resources. In support of Azerbaijan's environmental protection goals, a number of important laws, legal documents, and state programmes have been developed and approved in order to improve the ecological situation in the country.

Dynamics of Consumption-Production and Export-Import

Today, Azerbaijan's electricity generating capacities allow to completely ensuring the country's peak demand for electric energy. The country's generating capacities are used in various amounts and at different

times, which depends on demand, weather conditions, and seasons. Nonetheless, Azerbaijan has enough capacity to completely ensure the electricity supply. There are enough resources to ensure the peak energy demand of the country. It also allows exporting electrical power abroad. The changes on electricity production in last 20 years are shown on Table 3.

Table 3

Electricity Production in Azerbaijan (Billion kWt/h) (1995-2017)

Years	Electricity generation, billion kWt/h	TPP generation	HPS generation	Non-energy facilities	Through generators	Wind power	Solar photovoltaic energy
1995	17,044	15,401	1,556	86.6	...	-	-
2000	18,699	17,069	1,534	83.1	13.0	-	-
2005	22,872	19,344	3,009	430.5	88.0	-	-
2008	21,642	19,090	2,232	319.6	-	-	-
2010	18,710	15,003	3 446	259.7	-	0.5	-
2013	23,354	20,065	1,489	1,798	-	0.8	0.8
2015	24,688.4	20,904.6	1,637.5	1,955.3			
2016	24,952.9	20,699.0	1,959.3	2,062.0			
2017	24,320.9	20,445.4	1,746.4	1,899.5			

Note. Source: own construction according to data of the State Statistical Committee of the Republic of Azerbaijan http://www.stat.gov.az/source/balance_fuel/.

Figure 4 shows that how the balance changes after the year 2006. If before 2006 domestic consumption exceeded production, after 2006, the balance changes in favor of production. It gave opportunity to focus on export capabilities. However, one of the reasons for the fall in demand was substantial rises in tariffs tripled in January 2007 coupled with the implementation of the government's policy to install meters and increase bill collection, especially in the recent years for the Azerbaijan government has targeted to become an exporter of power generation in the region. This government program mainly played role to be targeted on preventing transmission and distribution losses, reforming energy legislation and framework to reach an energy efficiency result in economy. In other words, substantial rises in tariffs in January 2007 from 24 US$/MWh to 75 US$/MWh was not so significant if we compare the prices on Table 1 with the prices on Figure 2.

Meanwhile efficient use of energy resources became as one of important part of public administration strategies. Beginning in 2007, the Republic of Azerbaijan's figures pulled ahead of the world average and by 2011, the volume of goods and services produced in the country per energy unit was 1.6 times higher than the world average (see Figure 5). This happened because growth rates in the use of energy resources in the country between the years of 2005 and 2011 were higher than the growth of average world indicators. This was also due to the implementation of policies directed towards expanding the knowledge and abilities of civil servants and policy-makers who were working in development planning and management (Alakbarov, 2014, p. 133).

From 2001 to 2009, as Azerbaijan started to develop its oil and gas sector, GDP growth averaged 16% a year due to strong investment in this sector. Strong oil and gas production gains, high international oil prices and sharply higher public spending propelled growth to an average of 27% a year between 2003 and 2009 (Ciarreta & Nasirov, 2011). In this period, mostly government program for development were available for execution. As seen on Figure 5, however, the economy of Azerbaijan was fed by oil and gas production in that

period of time, energy efficiency policy was implemented parallel to foreign investments and diversification of energy transport.

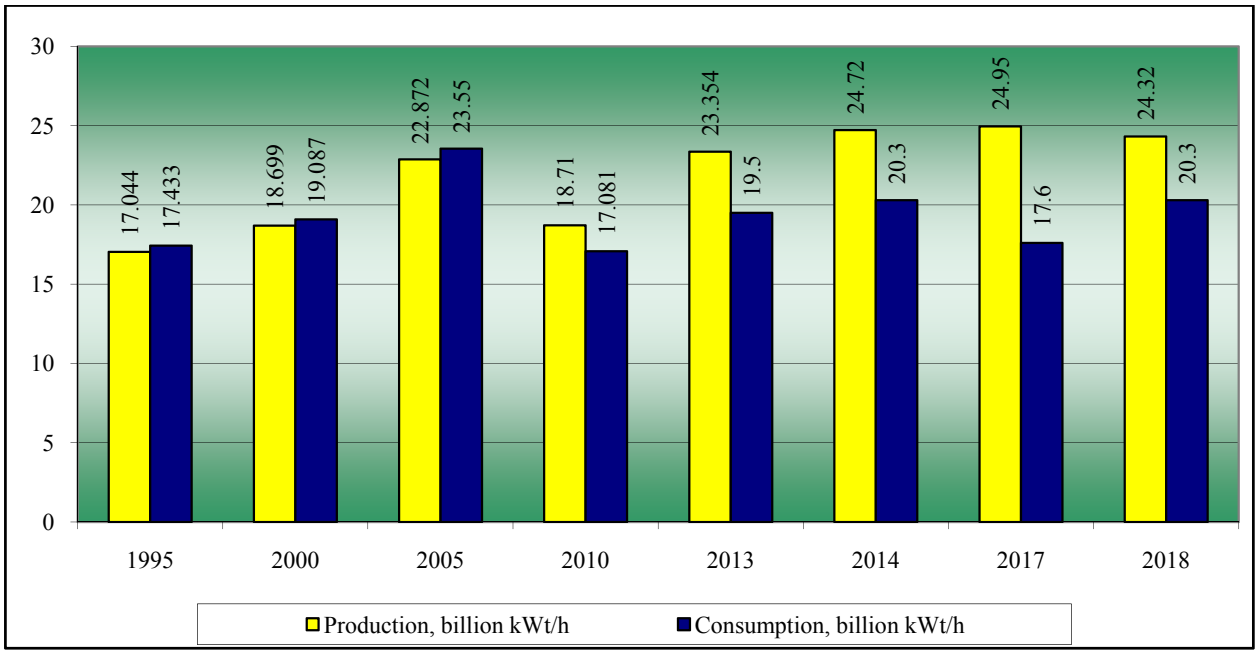

Figure 4. Dynamics of consumption and production of electricity in Azerbaijan for the years 1995-2018, billion kWt/h (Source: own construction according to data of Ministry of Energy of the Republic of Azerbaijan http://www.minenergy.gov.az/?e=526&a=2; and Index Mundi, Azerbaijan Electricity—consumption http://www.indexmundi.com/g/g.aspx?c=aj&v=81).

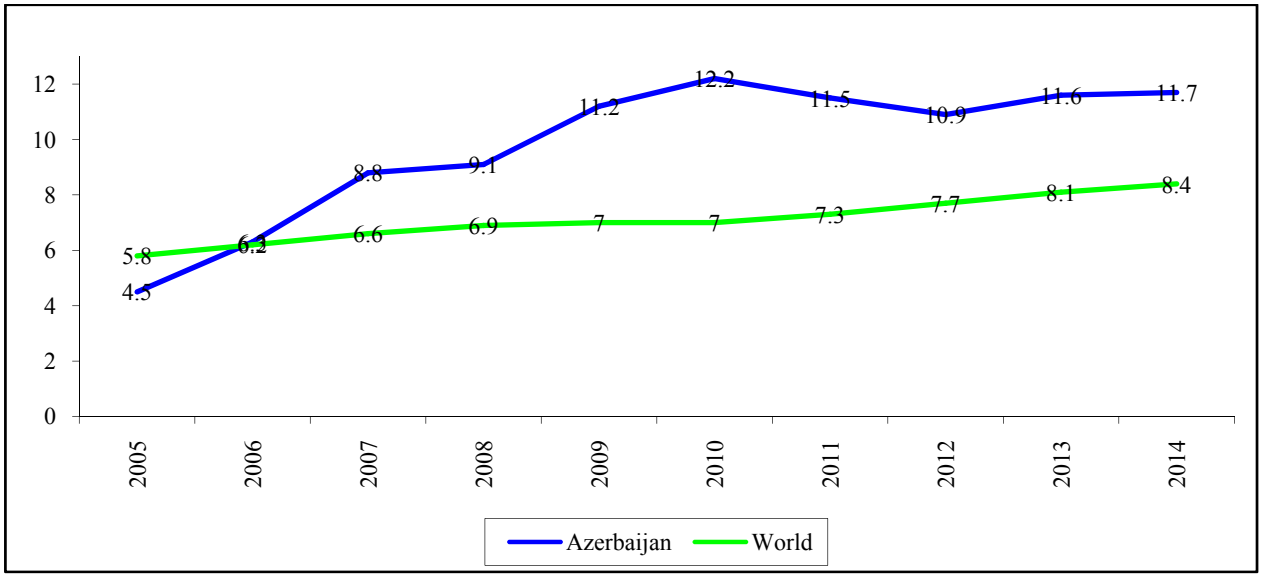

Figure 5. Energy efficiency: GDP (USD with PPP) per unit of energy (1 kg of oil equivalent) used (Source: Own construction according to data of World Bank: GDP per unit of energy use [PPP $ per kg of oil equivalent], http://search.worldbank.org/data?qterm=GDP+per+unit+of+energy+use&language=EN&format=; and Alakbarov, 2014).

Both strategic and commercial factors would determine the route of country's export pipelines. Export of oil and gas on an east-west route achieved only some of Baku's goals. It did help Azerbaijan to conduct a

balanced foreign policy toward Russia and the United States (Shaffer, 2010). All above aspects promote the country to open a new stage of development strategy till 2020 in Azerbaijan. Securing long-term energy independence is a stated policy goal for fostering economic growth. One of the main goals was to reduce domestic dependence from gas and oil energy supply. Strengthening power generation and renewable energy construction became an important goal to perform.

Figure 6 shows the import-export dynamics of electricity power from 1995 to 2003. After 2006, the balance had changed. In 2007, Azerbaijan became an exporter of electricity power. In recent years, the government has targeted to increase role of non oil and gas sectors of economy.

The demand on electricity is expected to double between 2012 and 2022; and to increase by almost 140% by 2025 (see Figure 7). The peak demand is also expected to double by 2022-2023 (USAID, 2013, Figure 8 and Table 4).

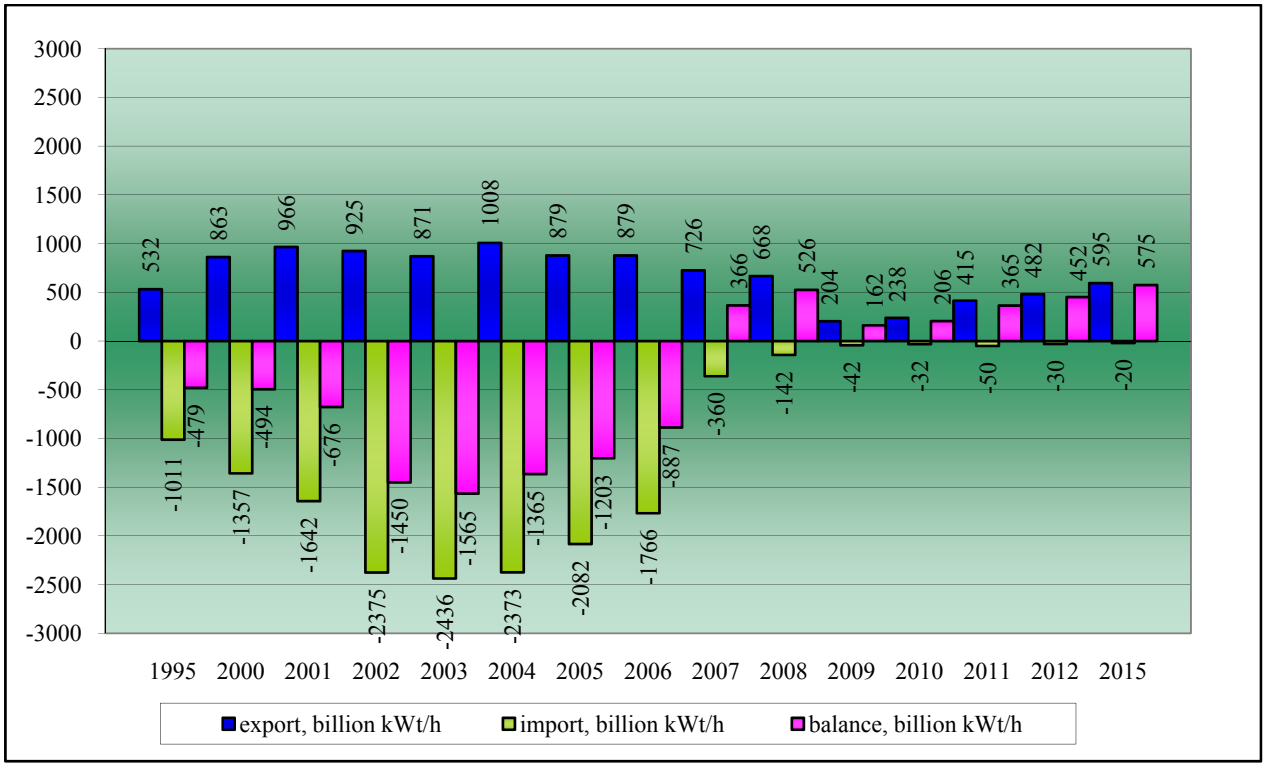

Figure 6. Dynamics of export and import of electricity in Azerbaijan for the years (1994-2011) (Source: Own construction according to data of Ministry of Energy of the Republic of Azerbaijan, http://www.minenergy.gov.az/?e=526&a=2; and Index Mundi, Azerbaijan Electricity Imports by Year, http://www.indexmundi.com/energy.aspx?country=az&product=electricity&graph=imports).

From the point of increasing demand for power generation in the future, it remains a huge work of investment on power generation in Azerbaijan. All power projects and production, technological processes, services, facilities, and devices connected with or related to the use of energy resources and their production, transmission and consumption are subject to mandatory certification, that is, confirmation of compliance with ecological, sanitary, fire, construction, and health and safety standards. In addition, major projects as defined in the Energy Resources Law require a feasibility study by the state commission created for such purposes. According to the Electricity Law, electricity is supplied under agreements between consumers and energy

suppliers. Agreements on the sale and purchase, transportation and exchange of electricity and heat must comply with the rules on the use of electricity. Energy consumption is subject to mandatory metering. The procedure for disconnecting consumers from the network (or the termination of the power supply) is regulated by the rules on the use of electricity, as well as by agreements with consumers.[7]

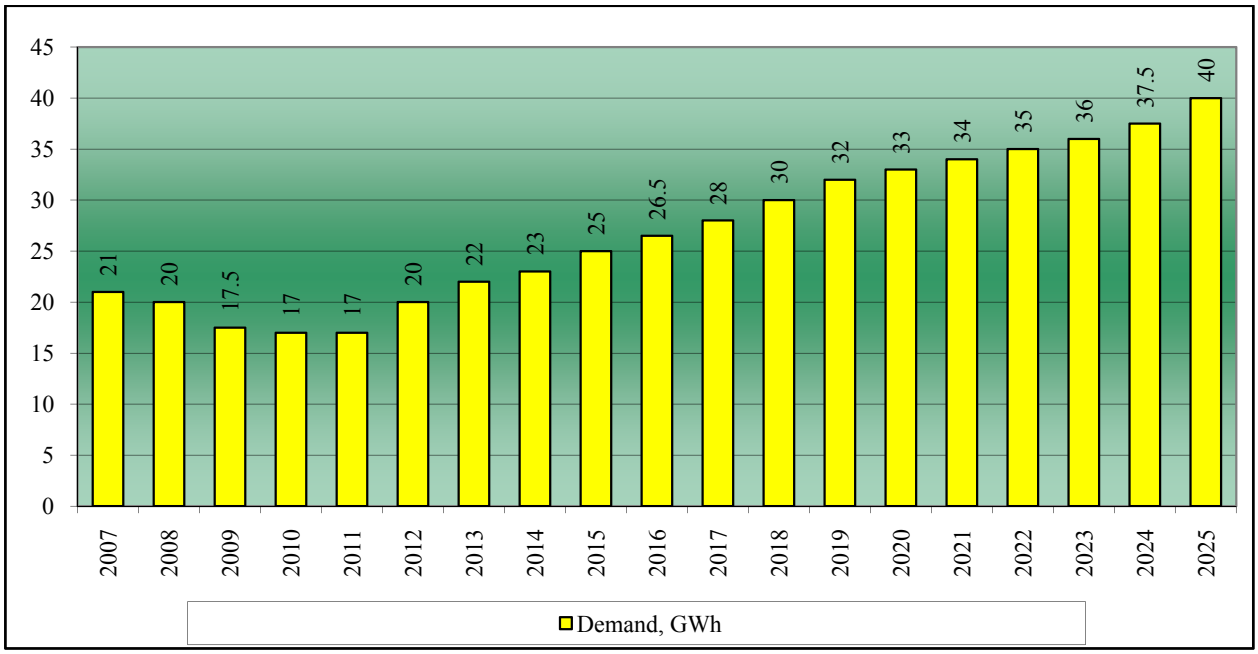

Figure 7. Demand projection for Azerbaijan (Source: Own construction according to data of Azerenergy JSC, http://www.azenerji.com/en/powersystem/powerlines.html).

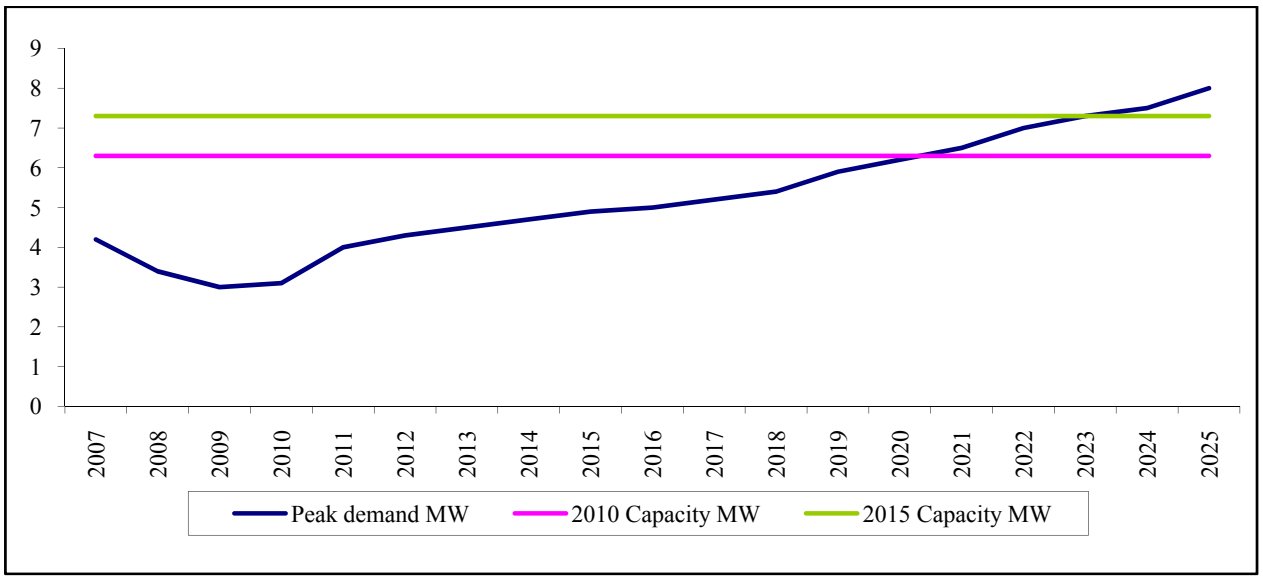

Figure 8. Estimated peak load power projection (Source: Own construction according to data of in-depth review of the Energy Efficiency Policy of Azerbaijan. Energy Charter Secretariat, 2013, Brussels, p. 30; and Azerenerji JSC, presentation to Fitch, March 2012).

[7] Azerbaijan. Follow-up in-depth review of the investment climate and market structure in the energy sector. Energy Charter Secretariat, 2011, Brussels, p. 75.

Table 4

Estimated Peak Demand on Energy of Azerbaijan

	Peak (GW)	Energy (TWh)	Change (%)
2015	4.7	24	5.5%
2020	6.3	32	4.7%
2025	8.2	39	4.7%

Note. Source: Own construction according to the data of USAID hydropower investment promotion project (HIPP) Regional Electricity Market Oversight (2013).

Transmission System: Interconnections With Neighbouring Countries

Azerbaijan historically has been part of the transmission grid IPS/UPS of CIS countries with a common mode of operation and centralized supervisory control. It has an installed generation capacity of 300 GW, and produces 1,200 TWh per year for its 280 million customers. The IPS includes the national networks of Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Mongolia, Tajikistan, and Ukraine. The Russian portion of the interconnection is known as Unified power system of Russia (UPS) and includes six regional transmission operators: ECO Center, ECO South, ECO North-West, ECO Middle Volga, ECO Urals, and ECO Siberia. IPS/UPS is synchronously interconnected with the Baltic countries. In addition, it has an inter-link with the Nordic system via a back to back High Voltage Direct Current (HVDC) connection in Finland with a capacity of 1,420 MW. Increasing transmission capacity and expanding the market by uniting with neighboring synchronous networks will make such manipulations more difficult.

Azerbaijan has a direct border with Russia, Iran, Turkey, Georgia, and Armenia on the land and border with Russia, Iran, Turkmenistan, and Kazakhstan by the Caspian Sea. Azerbaijan currently has one 330-kV line, one 110-kV line interconnection with Georgia, and a 330-kV line with another 330-kV line planned with Russia. Interconnection with Armenia includes a 330-kV line, one 220-kV line, and three 110-kV lines, all of which have been out of use since the Nagorno-Karabakh dispute. There are two 154-kV lines to Nakhchivan, one 132-kV line between Parsabad (Iran) and Imishli (Azerbaijan) and one 132-kV line at Astara (Azerbaijan). Finally, Turkey has one 150-kV line and one 220-230-kV line via Iran both to Nakhchivan (Azerbaijan) and there exist plans to build a 500-kV line the following interconnections with its neighbors (see Table 5).

Table 5

Azerbaijan Interconnections

Country	Type of connection	Maximum capacity (MW)	Current status of line
Armenia	One line 330-kV	420	Non-operational
	One line 330-kV		Non-operational
	Two lines 110-kV		Non-operational
Georgia	One line 500-kV	850	Operational
	One line 330-kV	250	Operational
Russia		500	Operational
Iran			Operational
			Operational
Turkey		100	Operational
		40	Operational

Note. Source: Own construction according to data of USAID hydropower investment promotion project (HIPP) Regional Electricity Market Oversight (2013).

Electric Power Transmission and Distribution Losses (kWh)

The value for electric power transmission and distribution losses (kWh) in Azerbaijan was 3,830,000,000 as of 2010. Over the past 20 years, this indicator reached a maximum value of 4,100,000,000 in 2009 and a minimum value of 2,153,000,000 in 1998[8] (see Figures 9 and 10).

In last five years, we observe two gross indicators of progress. Firstly, the reliability of power supplies has improved, leading to a flow of funds to the power sector in Azerbaijan. Secondly, a 90% collection rate of the electricity bills has been achieved. This happened after many years of significant problems, when transmission and distribution companies were unable to collect bills and consequently had insufficient funds to pay for the generated electricity.

The three priority areas for development in the energy sector of Azerbaijan are the following: (1) Rehabilitation of power grid for improvement of power supply quality and loss reduction; (2) development of renewable energy and improvement of demand-side EE; and (3) energy conservation.

Azerenergy is entitled to submit proposals on tariff increases and to take part in the tariff-regulation process, but final decision-making authority with regard to tariff determination in the electricity sector belongs to the Tariff Council. Azerbaijan's legislation neither requires transmission and distribution to be separated from generation, nor envisages the presence of a separate transmission system operator and a distribution system operator.[9] Accounting, functional, and/or managerial disaggregation has not been accomplished or envisaged by legislation. Nonetheless, partial disaggregation has occurred; some mini-power plants have been privatised and two independent regional distribution companies have been created.

Azerenergy is working on an energy corridor, Azerbaijan-Georgia-Turkey, in order to realise the export potential. From 2012, Azerbaijani electric power supplied to the market of Turkey and planning to export power to the European countries.[10]

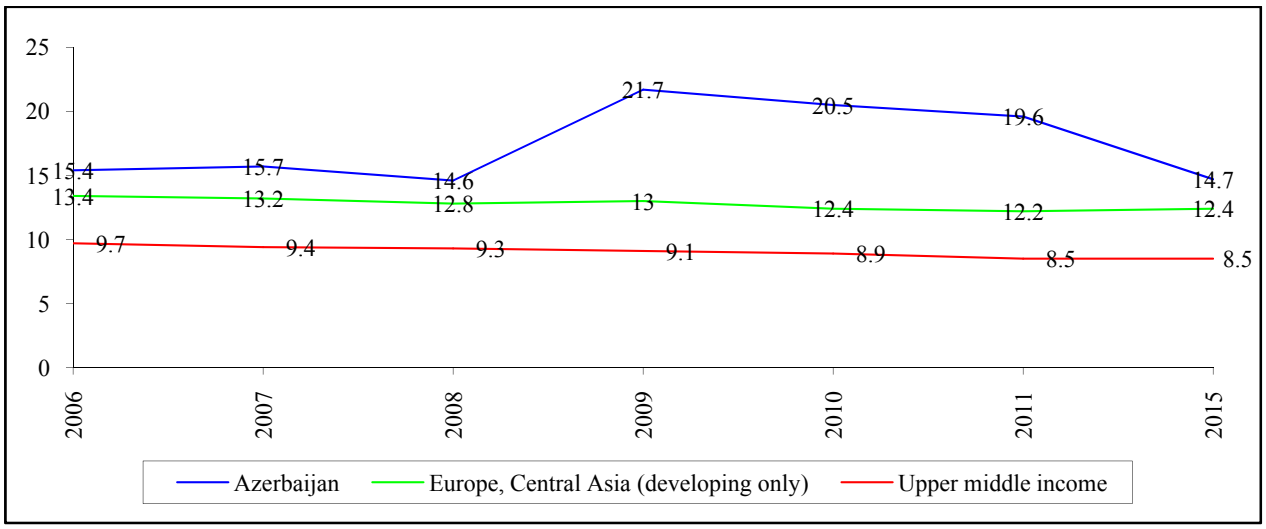

Figure 9. Electric power transmission and distribution losses (% of output) (Source: Own construction according to IEA Statistics © OECD/IEA 2014, http://www.iea.org/stats/index.asp).

[8] Definition: Electric power transmission and distribution losses include losses in transmission between sources of supply and points of distribution and in the distribution to consumers, including pilferage.
[9] Group C countries profile, http://www.ebrd.com/downloads/legal/irc/groupC.pdf.
[10] Azerbaijan. Follow-up in-depth review of the investment climate and market structure in the energy sector. Energy Charter Secretariat, 2011, Brussels, p. 75.

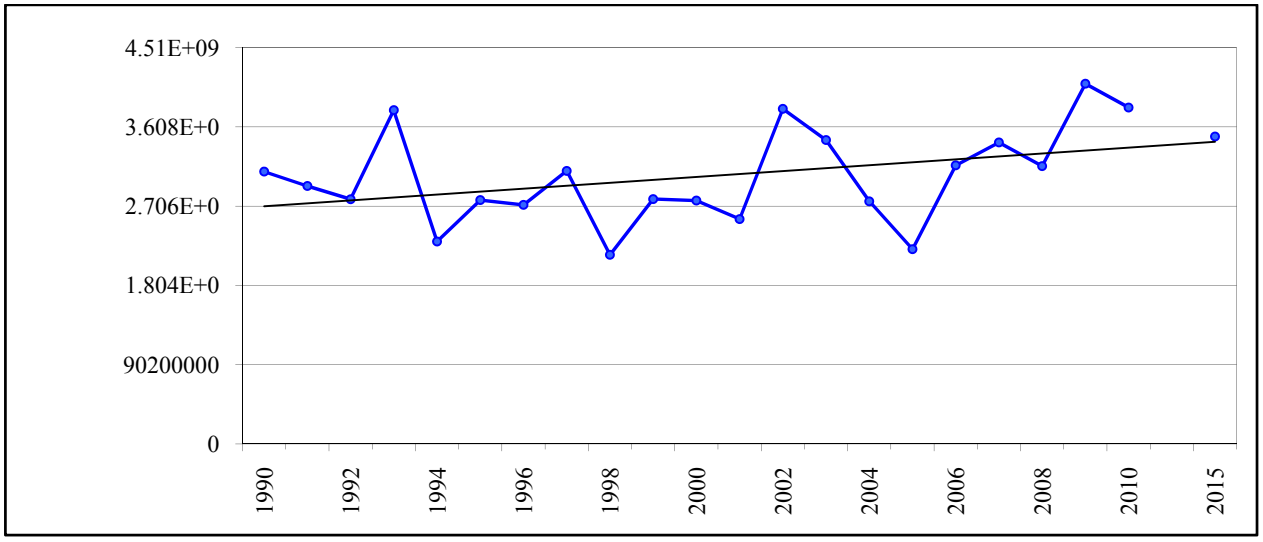

Figure 10. Electric power transmission and distribution losses (kWh) (Source: Own construction according to data of Index Mundi. Azerbaijan—Electric power transmission and distribution losses, http://www.indexmundi.com/facts/azerbaijan/electric-power-transmission-and-distribution-losses).

The Projects of Electric Power Transmission System

The total length of more than 30,000 km of transmission lines were put into operation and completed in 2009. Also, total capacity of more than 2,000 megavolt-ampere and 500 new transformers were installed in. There are currently working with more than 160 pre-paid card readers. During 2010-2015, under the planned projects in the electricity transmission system, there was installed new transformers with total capacity of 2,000 megavolt ampere and 110-500 kV with a total length of 800 km new lines increased.

SCADA EMS Telecom Energy Project (accounting system for transmission). The control system of the power system SCADA/EMS is a key component of the development of the electric power transmission system. For the implementation of the project SCADA/EMS system, it was signed contract with the France company "AREVA" on November 9, 2007.

SCADA/EMS/Telecom/Energy accounts (accounting) Project includes 50 objects of the power system of Azerbaijan. SCADA system has an ability to combine more objects in the future. The system is capable of development and enlargement. The main components of the project include the total length of 850 km of modern fiber-optic communication line system, changing of telephone stations, also installation ALCATEL-type of new telephone system. Moreover, upwards of 110 kV substations and power plants (45 of the total number of objects) technology for data collection and processing terminals and fast installation of computer equipment. To get furthermore data acquisition, the project provided for in the existing substations and power plants adapted to be able to use the equipment. At modernization of the existing main dispatch center and backup dispatch center, the intellectual consider establishing a system of power with the use of electric meters and training of staff.

Implemented projects of SCADA/EMS design and implementation are communication (Telecom) system design, high-frequency performance of the communication system, implementation of the phone system, design and implementation of optical-fiber cable system, installed fiber-optic lines and their experiment was carried out in full, telemetry and technology for data collection and processing terminals (RTU) the design and implementation. Besides that projection of adaptation work, adaptation work, design of the system,

performance of the system, staff training and project provided for the installation of equipment are implemented.

Also, software systems are being repaired. At the same time, staff of the "Azernerji" JSC are trained in new techniques during the installation and testing of the operation and maintenance.

Nuclear research by ministry of communications and high technologies. Azerbaijan has signed a decree in 2014 to create the National Center for Nuclear Research CJSC under the Ministry of Communications and High Technologies for using nuclear technologies for peaceful purposes. Azerbaijan has already begun cooperation with the International Atomic Energy Agency (IAEA) and European Centre for Nuclear Research (CERN) in this field. The work on construction of the power plant in Azerbaijan began during the USSR period, but was cancelled. Today, it is actual again to train nuclear specialists and produce medical isotopes, Azerbaijan's Institute of Radiation Problems had planned to build a 15 MWe, research reactor. The IAEA gave preliminary approval to the project in June 2008, and construction was scheduled to begin in 2012. For an additional nuclear reactor construction, Azerbaijan did not take preliminary approval from the IAEA yet, but in case of approval, it is planning of construction of the reactor. France's VINCI Construction Grands Projets expressed interest in participating in this project. The company has experience in this sphere and has implemented around 47 construction projects. In the field of nuclear energy, Azerbaijan cooperates with South Korea, France, Russia, and other countries. It conducts joint research with specialists of these countries to study innovations in nuclear technology.[11]

According to the Institute of Radiation Problems of the Azerbaijan National Academy of Sciences (ANAS), feasibility studies for the reactor were supposed to be completed in 2013. Azerbaijan is still conducting feasibility studies for this reactor. Azerbaijan is a participant in the Commonwealth of Independent States (CIS) Committee on the Peaceful Use of Nuclear Energy. The CIS Council of the Heads of Government recently adopted the Committee's long-term program for inter-state cooperation.[12]

The nuclear facility would be situated on a plot of government-owned land 15 kilometers north of the capital, Baku. The location for the construction of the reactor is based on international experience. It is located away from residential areas.

The state regulation as regards the safe use of nuclear energy and ionizing radiation and the safe management of radioactive waste is implemented by the Ministry of Emergency Situations (MES). The ministry is the central executive authority established in 2006 and has wide competences in the field of emergency situations as well as the safe transportation and utilization of nuclear waste.

Other projects. The restoration of electric power transmission system projects aims to increase the reliability and quality of electricity supply, as well as the economic efficiency of high-voltage power transmission lines in order to achieve the management and operation of the network, improving the SCADA system that meets international standards and rehabilitation of the transmission sector. Project Consultant was the "KEMA" and "Dar Al-Handasah" companies, as a Contractor "Alstom Grid", "Bhel", and "ABB". By this project, it was tasked modern electric power system dispatching management system (SCADA/EMS) creation; the creation of modern communication systems, including fiber-optic lines, substations and power plants and rapid technological terminals for data collection and processing of computer equipment installation,

[11] Azerbaijan State Information Agency, Azer Tac, http://azertag.az/xeber/67585.
[12] Azerbaijan Trend Information Agency, http://en.trend.az/azerbaijan/2273430.html.

reconstruction, and replacement of the main dispatch the establishment of a central office. In addition, power transmission system restoration of high-voltage power transformers and other substation equipment (switches, insulators, current, and voltage transformers) were the installation.

Conclusion and Policy Recommendations

Energy market grow and liberalization is a long process that requires strong and sustained political commitment, extensive and detailed preparation, and continuous development to allow for necessary improvements while sustaining ongoing investment. It is, in fact, a process that has not yet been completed anywhere in the world. In recent years, some elements of dynamism have been introduced in the electricity sector through the privatization of mini-power plants and the establishment of two independent regional electricity distribution companies in Azerbaijan. With prospects of sustained demand growth through to 2020, the power sector will require substantial investment for the construction of new electric generation plants, refurbishment of existing facilities and strengthening of the power grid. The rehabilitation of the generation, transmission, and distribution assets in the power sectors need to continue. This will maximize the fuel burning efficiency and minimize the technical transmission and distribution losses. Also, future energy strategies and policies should be transparent and consistent with long-term goals and should consider initiating programs for energy efficiency and setting objectives for key sectors. In the future, it will be necessary to ensure renewal of the capacities of the Azerbaijani thermal electric power station, which has been in service for 30 years, or provide alternative generating capacities. Besides that, wind power and solar photovoltaic energy must be developed as well as at the state level and at the household level in every apartment, especially in capital city where annual sunny and windy days exceed. It could contribute to energy efficiency of capital city, sustainable development, ecological issues, and faster socio-economic development.

Stronger rule of law continued sustainable energy policy reform and effective implementation of key energy legislation, continued energy market liberalization and integration with regional markets. The absence of a clearly independent regulatory authority complicates effective management of regulatory framework. Similarly, the vertically-integrated monopolies which characterize the electricity and gas sectors, as well as the absence of a market opening time frame penalize the score given to market structure. In the other hand, previous empirical studies on relationship between energy market reforms and energy prices provided that relationships between electricity market liberalization and electricity prices are complicated. Moreover, reforms to traditional regulatory arrangements governing the distribution and transmission networks have generally been viewed as an important complement to the introduction of wholesale and retail competition to supply consumer energy needs. Privatization of distribution and transmission companies combined with the application of Performance Based Regulation imposes hard budget constraints on regulated network firms and provides better incentives for them to reduce costs and improve service quality. In addition, the efficiency of competitive wholesale and retail markets depends on a well-functioning supporting transmission and distribution network infrastructure. A strong political commitment to reform is important.

Implementing a good electricity sector liberalization program is a technical, institutional, and political challenge. Furthermore, it is necessary to enhance energy security by increasing conventional and unconventional fuels production, utilizing renewable energy potential and maximizing energy efficiency gains, and diversifying energy supplies via new interconnections with neighboring markets. Also, to increase a consumer excess potentially competitive segment, as generation, marketing, and retail supply could be

vertically separated from segments that will continue to be regulated (distribution, transmission, and system operations) either structurally or functionally. These changes are thought to be necessary to guard against cross-subsidization of competitive businesses from regulated businesses and discriminatory policies affecting access to distribution and transmission networks upon which all competitive suppliers depend. But in horizontal restructuring of the generation segment, to create an adequate number of competing generators to mitigate market power and to ensure that wholesale markets are reasonably competitive. In this way, the application of regulatory rules and supporting network institutions can promote efficient access to the transmission network by wholesale buyers and sellers in order to facilitate efficient competitive production and exchange. This includes mechanisms efficiently to allocate scarce transmission capacity among competing network users, and to provide for efficient sating and interconnection of new generating facilities. Finally, creation of independent regulatory agencies with good information about the costs, service quality and comparative performance of the firms supplying regulated network services, the authority to enforce regulatory requirements, and an expert staff to use this information and authority to regulate effectively the prices charged by distribution and transmission companies and the terms and conditions of access to these networks by wholesale and retail suppliers of power, are also an important but underappreciated component of successful reforms. Transition mechanisms must be put in place to move from the old system to the new system. These mechanisms should be compatible with the development of well-functioning competitive markets.

References

Ahmadov, E. (2013). Azerbaijan in the context of competitiveness, sustainable development and green economy. *Materials of the Baku International Humanitarian Forum*. October 31, Baku, Azerbaijan.

Aitken, M. (2010). Why west still don't understand the social aspects of wind power: Acritique of key assumptions within the literature. *Energy Policy, 38*, 1834-1841.

Alakbarov, U. (2014). Effective management of resources to support sustainable development and move towards ecological civilization: Experience of the Republic of Azerbaijan. *Journal of Human Resource and Sustainability Studies, 2*(3), 131-135.

Aliyev, F. (n.d.). Azerbaijan national case study for promoting energy efficiency investment: An analysis of the Policy Reform Impact on Sustainable Energy Use in Buildings. Retrieved http://www.unece.org/fileadmin/DAM/energy/se/pdfs/gee21/projects/cs/CS_Azerbaijan.pdf

Baris, K., & Kucukali, S. (2012). Availibility of renewable energy sources in Turkey: Current situation, potential, government policies and the EU perspective. *Energy Policy, 42*, 377-391.

Billion, D. (2014). *What is Azerbaijan's role in the new geopolitics of energy? Report of the seminar on the role of Azerbaijan in the new geopolitics of energy, organised by TEAS and IRIS*. Paris: The French Institute for International and Strategic Affairs.

Bulkeley, H., & Kern, K. (2006). Local government and the governing of climate change in Germany and the UK. *Urban Studies, 43*(12), 2237-2259.

Ciarreta, A., & Nasirov, S. (2011). Development trends in the Azerbaijan oil and gas sector: Achievements and challenges. *Energy Policy, Elsevier, 40*(C), 282-292.

Del Rio, P., & Unruh, G. (2007). Overcoming the lock out of renewable energy technologies in Spain: The cases of wind and solar electricity. *Renewable and Sustainable Energy Reviews, 11*(7), 1498-1513.

European Bank for Reconstruction and Development Annual Report 2009. Azerbaijan Country Profile. Information provided from EBRD is drawn primarily from official answers provided by the Ministry of Economic Development of Azerbaijan to a number of questions prepared within this project's framework. https://www.ebrd.com/azerbaijan.html

Fouquet, D., & Johansson, T. (2008). European renewable energy policy at cross roads: Focus on electricity support mechanisms. *Energy Policy, 36*, 4079-4092.

Morthorst, P.E.,& Chandler, H.(2004). The cost of wind power: The facts within the fiction. *Renewable Energy World, 7,* 126 – 137.

Joskow, P. L. (2008). Lessons learned from electricity market liberalization. *The Energy Journal, 29*(1), 9-42. Retrieved from http://economics.mit.edu/files/2093

Karimova, A. (2015) SOCAR Turkey Enerj to become largest industrial company in Turkey by 2023. https://www.azernews.az/oil_and_gas/87405.htm

Kern, K., & Alber, G. (2008). Governing climate change in cities: Modes of urban climate governance in multilevel systems. *The 2nd Annual Meeting of the OECD Roundtable Strategy for Urban Development.* October 9-10, Milan, Italy.

Loring, J. M. (2007). Wind energy planning in England, Wales and Denmark: Factors influencing project success. *Energy Policy, 35*, 2648-2660.

Lüthi, S., & Prässler, T. (2011). Analyzing policy support instrument sand regulatory risk factors for wind energy deployment: A developers' perspective. *Energy Policy, 39*, 4876-4892.

Malagueta, D., Szklo, A., Borba, B., Soria, R., Aragão, R., Schaeffer, R., & Dutra, R. (2013). Assessing incentive policies for integrating centralized solar power generation in the Brazilian electric power system. *Energy Policy, 59*, 198-212.

Shaffer, B. (2010). Caspian energy phase II: Beyond 2005. *Energy Policy, 38*, 7209-7215.

United Nations Environment Programme (UNEP). (2009). Delivering the transition to energy efficient lighting in Azerbaijan. Retrieved from http://addis.unep.org/projectdatabases/00943/project_general_info

Memorandum, Law, Reports and Decisions

Azerbaijan. Follow-up in-depth review of the investment climate and market structure in the energy sector. Energy Charter Secretariat, 2011, Brussels.

Azerbaijan | U.S. Agency for International Development – USAID, 2013.https://www.usaid.gov/azerbaijan

Decision No.17 of the Tariffs (Price) Council of Azerbaijan Republic.

EU and Azerbaijan enhance the Memorandum of Understanding on Energy. Baku, 2013.

European Residential Energy Price Report 2012. Vaasa ETT Global Energy Think Tank.

Memorandum of understanding on a strategic partnership between the European Union and the Republic of Azerbaijan in the field of energy. http://www.europarl.europa.eu/meetdocs/2009_2014/documents/ dsca/dv/dsca_20130321_14/ dsca_2013 0321 _14en.pdf

Index Mundi Azerbaijan Report—Electric power transmission and distribution losses. Retrieved from http://www.indexmundi.com/facts/azerbaijan/electric-power-transmission-and-distribution-losses

INOGATE, Regional Energy Cooperation Programme between the European Union and 11 partner countries in Eastern Europe, Caucasus and Central Asia. Retrieved from http://www.inogate.org/

International Dialogue for Environmental Action: The future is in our hands, our goals and achievements. Report (2011, 2013).

International Energy Agency, Energy Market Experience: Lessons from Liberalized Markets, OECD/IEA (2005).

Law of the Azerbaijan Republic "On Electric Power Stations" (in Azerbaijan language). Retrieved from http://www.azenerji.com/az/powersystem/law/Elektrik_stansiyalari_haqqinda.pdf

Law of the Azerbaijan Republic "On Natural Monopolies" (in Azerbaijan language) Retrieved from http://www.azenerji.com/az/powersystem/law/Tebii_inhisarlar_haqqinda.pdf

Law of the Azerbaijan Republic "On power engineering" (in Azerbaijan language). Retrieved from http://www.azenerji.com/az/powersystem/law/Energetika_haqqinda.pdf

Law of the Azerbaijan Republic "On Power Industry" (in Azerbaijan language). Retrieved from http://www.azenerji.com/az/powersystem/law/Elektroenergetika_haqqinda.pdf

Law of the Azerbaijan Republic "On Protection of foreign investment" (in Azerbaijan language). Retrieved from http://www.azenerji.com/az/powersystem/law/Xarici_investisiyalarin_qorunmasi_haqqinda.pdf

Law of the Azerbaijan Republic "On Utilization of Energy Recourses" (in Azerbaijan language). Retrieved from http://www.azenerji.com/az/powersystem/law/Enerji_resurslarindan_istifade_haqqinda.pdf

Memorandum of understanding on a strategic partnership between the European Union and the Republic of Azerbaijan. Brussels, 2006.

Rules for Utilization of Electric Energy (in Azerbaijan language). Retrieved from http://www.azenerji.com/az/powersystem/law/EEI_qaydalari.pdf

Rules of Use of Electric Power, approved by 18th Decree of Cabinet of Ministers of the Republic of Azerbaijan, 2005. Secretariat, 2013, Brussels. Retrieved from http://www.encharter.org/fileadmin/user_upload/Publications/Azerbaijan_EE_2013_ENG.pdf

State program on development of fuel-energy sector in Azerbaijan Republic (in 2005-2015 years) (in Azerbaijan language). Retrieved from http://www.azenerji.com/az/powersystem/law/Dovlet_enerji_proqrami.pdf

State Program on Poverty Reduction and Sustainable Development in the Republic of Azerbaijan for 2008-2015. Retrieved from http://www.cled.az/pdf/others/Azerbaijan%20Poverty%20Program%20for%202008-2015.pdf

State Program on socio-economic development of regions in the Republic of Azerbaijan for 2008-2015.

State program on use of alternative & renewable energy sources in Azerbaijan Republic (in Azerbaijan language). Retrieved from http://www.azenerji.com/az/powersystem/law/Alternativ_enerji_proqrami.pdf

Support to the implementation of the EU-Azerbaijan Partnership and Cooperation Agreement. Twinning Contract. Legal Approximation and Structural Reform in the Energy Sector of Azerbaijan.

Taxation and Customs Union of EC. Retrieved from http://ec.europa.eu/taxation_customs /customs/customs_duties /rules_origin/ customs_unions/index_en.htm

The Central Bank of the Republic of Azerbaijan, Financial Stability Review, 2013 and Quarter I, 2014.

The State Statistical Committee of the Republic of Azerbaijan. Retrieved from http://www.stat.gov.az/indexen.php

The Tariff (Price) Council of Azerbaijan Republic. Retrieved from http://www.tariffcouncil.gov.az/?/az/content/44/

Trend Azerbaijan. Retrieved from http://az.trend.az/business/energy/2238630.html

U.S. Energy Information Administration. Retrieved from http://www.eia.gov/countries/country-data.cfm?fips=aj