Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects

PEEREA

In-Depth Review of the Energy Efficiency Policy of the Republic of Azerbaijan

INTERNATIONAL ENERGY CHARTER

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2019

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Acronyms

Acronyms

ADB	Asian Development Bank
AERA	Azerbaijan Energy Regulatory Agency
APG	Associated petroleum gas
AR	Autonomous Republic
AZN	Azerbaijani Manat
bcma	Billion cubic metres of gas per annum
BP	British Petroleum
C2E2	Copenhagen Centre on Energy Efficiency
CCPP	Combined cycle power plant
CDD	Central dispatching department
CENEf	Center for Energy Efficiency
CESD	Center for Economic and Social development
CHP	Combined heat and power
CIS	Commonwealth of Independent States
CNG	Compressed natural gas
DSM	Demand-side management
DSO	Distribution system operator
EaP	Eastern Partnership
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EE	Energy efficiency
EEAP	Energy Efficiency Action Plan
EED	Energy Efficiency Directive
EMS	Energy management system
EPBD	Energy Performance in Building Directive
EPC	Energy Performance Contract
ERSP	Energy Reform Support Programme
ESCO	Energy Service Company
ESIB	Energy Saving Initiative in the Building Sector in Eastern Europe and the Central Asian Countries
EU	European Union
FDI	Foreign direct investment
FFD	Full Field Development
FIT	Feed-in tariff
GDP	Gross domestic product

GEF	Global Environment Facility
GGFR	Global Gas Flaring Reduction Partnership
GHG	Greenhouse gas
GoA	Government of Azerbaijan
HiQSTEP	High Quality Studies to Support Activities under the Eastern Partnership
HPP	Hydro power plant
IEA	International Energy Agency
IMF	International Monetary Fund
INDC	Intended nationally determined contribution
IPCC	Intergovernmental Panel on Climate Change
KfW	German Development Bank
kgce	Kilogram of coal equivalent
KPI	Key performance indicator
kV	Kilovolt
kWh	Kilowatt-hour
LED	Light-emitting diode
LEED	Leadership in Energy and Environmental Design
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
LULUCF	Land use, land-use change and forestry
MEPR	Minimum energy performance requirement
MEPS	Minimum energy performance standard
MoE	Ministry of Economy
MoEn	Ministry of Energy
MoENR	Ministry of Ecology and Natural Resources
MoU	Memorandum of Understanding
Mtce	Million tonne of coal equivalent
Mtoe	Million tonnes of oil equivalent
MW	Megawatt
NAMA	Nationally Appropriate Mitigation Actions
NCCSD	National Coordination Council for Sustainable Development
NEEAP	National Energy Efficiency Action Plan
NGO	Non-governmental organisation
NO_2	Nitrogen dioxide
OECD	Organisation for Economic Co-operation and Development
OJSC	Open joint-stock company

PLE	Public legal entity
pp	Percentage point
PPP	Purchasing power parity
PU	Production unit
RES	Renewable energy sources
RESSD	Regional energy supply and sales department
SAARES	State Agency on Alternative and Renewable Energy Sources
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SME	Small and medium-sized enterprise
SO_2	Sulphur dioxide
SOCAR	State Oil Company of the Azerbaijan Republic
SOFAZ	State Oil Fund of the Republic of Azerbaijan
sq.km.	Square kilometres
SRM	Strategic Roadmap
SSC	State Statistics Committee of the Republic of Azerbaijan
TA	Technical assistance
TANAP	Trans–Anatolian Pipeline
TAP	Trans Adriatic Pipeline
tce	Tonne of coal equivalent
TFC	Total final consumption
toe	Tonne of oil equivalent
TPES	Total primary energy supply
TPP	Thermal power plant
TSO	Transmission system operator
U4E	United for Efficiency
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	United States dollar
VAT	Value-added tax
WB	World Bank
WTC	Waste treatment centre

Executive Summary

Executive Summary

Background

The Republic of Azerbaijan (Azerbaijan) is an energy-rich country that became a major regional energy player after restoring its independence in 1991. The country's territory covers an area of 86,600 sq. km and borders Russia, Georgia, Iran, Turkey and Armenia. Azerbaijan has a population of about 10 million, 53% of whom reside in urban areas. Due to its geographical position, the territory of Azerbaijan includes eight out of 11 existing world climate zones.

Azerbaijan is an upper-middle income country, with a gross domestic product (GDP) per capita at purchasing power parity (PPP, current international USD) of 17,460, representing 43% of the EU28 average in 2017. Oil exports have constituted the main revenue source for the economic development of the country, rendering it vulnerable to external shocks and changes in global oil prices. The Government of Azerbaijan (GoA) has devoted significant efforts to develop its non-oil sector, leading to an increase in the non-oil share of its economy in GDP from 38% in 2008 to 57% in 2017.

As of 2017, one third of all GDP-generating activities are related to oil and natural gas extraction, yet this sector employs less than 1% of the employed population. At the same time, 37% of the working population are involved in agricultural sector, contributing 6% to the GDP. Transportation, distribution and storage of electricity, natural gas and heat energy contribute 1% to the GDP and employ 5% of the employed population. The unemployment rate was about 5% in 2017.

During 2008–2017, almost 90% of all energy investments were related to the extraction of hydrocarbons and 9% to the development of the electricity sector, including renewables. Investments in natural gas and heat distribution and supply sectors were insignificant compared with other energy subsectors. Azerbaijan is a Commonwealth of Independent States (CIS) leader, ranked 25 among 190 economies in the 2019 Ease of Doing Business rating.

The energy intensity of Azerbaijan decreased by 14% or from 0.105 to 0.090 tonnes of oil equivalent (toe) per thousand 2011 USD PPP during 2007–2016. It followed almost the same dynamics as the energy intensity of the European Union (EU). The country's energy intensity indicator is the lowest in the Eastern Partnership (EaP) region.

Energy Supply and Demand

Azerbaijan is a large oil and gas producer and a net energy exporter. Indeed, the country exported an average 77% of all produced energy during 2008–2017. Crude oil has constituted the largest exported commodity, in 2017 representing 78% of total exports, with natural gas representing 19% and other types of energy carriers 3%. Azerbaijan also uses produced hydrocarbons to cover an internal energy demand that increased by 12% during 2008–2017. The residential and transport sectors have been the dominant energy consumers in the last decade. In 2017, the share of renewable energy accounted for 1.66% of the total primary energy supply and was mainly represented by hydropower plants.

There are neither nuclear nor coal facilities in Azerbaijan, with natural gas the primary source for electricity generation. During 2008–2017, the total installed generating capacity of the country increased by 37% and was about 8 GW at the end of the analysed period. At the same time, electricity generation increased by only 12% over the same period. As of 2017, gas-powered and hydro plants represented 85% and 14% of the total installed capacities and generated 92% and 7% of the total electricity produced, respectively.

In 2017, Azerbaijan was ranked 20th in the world for its proven oil reserves and 23rd for its oil production. Oil production reached its peak in 2010 and has been decreasing since then. The consumption of oil products on the domestic market increased by 45% over the last decade. Both factors resulted in the steady reduction of crude oil and petroleum products export during 2011–2017.

In 2017, the country was ranked 27th for its natural gas reserves and 32nd for its natural gas production. Although Azerbaijan has historically been an oil producer, its significance in the region is growing as a gas producer and exporter. The export of natural gas increased from 32.2% of total production in 2008 to 48.7% in 2017. To cover the recent imbalance of demand and supply on external markets, Azerbaijan started importing natural gas and the volume of import has increased from 1.6% of gas production in 2016 to 11.6% in 2017. Despite some structural changes, the total consumption of natural gas on the internal market in 2017 remained almost at the same level as in 2008.

The primary source for the production of heat energy in Azerbaijan is natural gas. There have been significant fluctuations in heat energy production and consumption over the last decade, but the level of production of heat energy in 2017 was only 6% higher than in 2008.

Market Structure for Electricity, Natural Gas and Heat

Since the reforms of 2015, the electricity market of Azerbaijan comprises two state-owned natural monopolists as well as state-owned and private generators that operate in the mainland of the country. Azerenerji OJSC is the transmission system operator (TSO) and the largest electricity producer, owning 85% of all generating capacities. Electricity distribution and supply functions in Azerbaijan's mainland are assigned to Azerishig OJSC. Electricity generation, transmission, distribution and supply in the landlocked exclave of the country are executed by the State Energy Service of Nakhchivan Autonomous Republic (AR). In total, 50 out of 57 plants or 91.5% of all installed capacity belongs to state-owned companies. Natural gas is the primary source for 82% of generating capacities. Meanwhile, large hydro represents 15.5% and RES sources 1.8% of the total installed capacity.

The State Oil Company of the Azerbaijan Republic (SOCAR) is the state-owned monopoly that is among other activities involved in the exploration, extraction, transmission, distribution and supply of natural gas. The natural gas upstream sector in Azerbaijan is mainly concentrated in the Shah Deniz field located in the deep-water shelf of the Caspian Sea. The continued development of this field can potentially bring six bcma of gas to Turkey and ten bcma of gas to the EU via the Southern Caucasus, Trans-Anatolian (TANAP) and Trans Adriatic (TAP) pipeline projects.

The functions of production, distribution and supply of heat energy are assigned to Azeristiliktechizat OJSC. The company was established in June 2005 and currently operates in 51 of 63 of the administrative regions of Azerbaijan. Despite the recent increase in the number of connected residential consumers, less than 3% of residential buildings in Azerbaijan have access to district heating services.

Energy Pricing Policy

The Tariff Council is the leading responsible authority for the approval of energy tariffs in Azerbaijan. Although the Council was officially cut off from state budget funding in January 2019 and there is now a new Energy Regulatory Agency (AERA), the Council remains functional based on the voluntary representation of all concerned state authorities. AERA was established in December 2017 as a public legal entity that is subordinate to the Ministry of Energy (MoEn). After the adoption of the draft Law on the Regulator, which was developed with the support of the European Bank for Reconstruction and Development (EBRD), all functions related to the calculation and approval of energy tariffs should be transferred from the Tariff Council to AERA.

Electricity tariffs in Azerbaijan were relatively stable during 2008–2017, seeing only three major changes in tariff rates and structure. The latest changes were related to the introduction of inclining block tariffs for residential consumers and purchase prices from generators using alternative and renewable energy sources. The recent tariff changes led to social discontent and resulted in a retrospective threshold increase of the first tariff block from 250 kWh to 300 kWh per month in December 2016.

Similarly to the dynamics of electricity tariffs, natural gas tariffs have also been relatively stable. The latest changes in the tariff policy were also related to the introduction of inclining block tariffs. The initial first block of 1,500 m^3 per year was retrospectively increased to 1,700 m^3 in December 2016 and further increased to 2,200 m^3 in May 2019.

There were no changes to district heating tariffs over the last decade, except the deregulation of hot water prices in November 2016. After the removal of hot water tariffs from the list of the state-regulated tariffs (prices), Azeristiliktejhizat JSC increased hot water tariffs by almost five times in January 2017. Despite this significant increase, hot water tariffs remain below the cost-reflective level.

Existing energy tariffs in Azerbaijan are determined based on a general "cost plus" methodology and there are no separate rules as to the calculation of electricity, natural gas and heat tariffs. Under the current tariff methodology, there are no incentives for utilities to improve the cost-efficiency of their services. On the contrary, the methodology provides wrong incentives to increase operational costs to justify a higher need for the regulated revenue. Targets for the reduction of energy losses are envisaged only for electricity network operators.

The tariff system includes cross-subsidies between consumer groups and energy carriers as well as direct subsidies from the state budget. The non-cost-reflective energy tariffs are part of the social policy of the country. The results of the price gap estimation analysis, based on average export prices and the opportunity cost of export to neighbouring countries, show that direct subsidies to electricity, natural gas, and heat consumers exceeded 3.2 billion USD during 2015–2017. Energy tariffs in Azerbaijan are also among the lowest in the region.

Energy and Energy Efficiency Policy

As of 2019, there is no energy strategy in Azerbaijan, although the MoEn has already started cooperating with the EU to develop a long-term energy strategy. The main driving force for implementing reforms and updating the legislative framework is the Presidential Decree on "The Acceleration of Reforms in the Energy Sector of Azerbaijan". The Decree stipulates responsible authorities and strict deadlines for the development and submission for approval of relevant draft legislative acts.

The 12 Strategic Roadmaps (SRM) constitute the most recent set of adopted strategic documents. The main act is the "Strategic Road Map on National Economy Perspectives", which is accompanied by 11 Sector Roadmaps, some of which are restricted. The main SRM and those on Oil and Gas Industries (Including Chemical Products) Development and Public Utilities (Including Electricity, Heat, Gas, and Water) Development are the key documents related to the energy sector. The main SRM does not have measurable energy-related targets and the SRM on Oil and Gas is restricted. The SRM on Public Utilities includes specific goals for power, including renewables, natural gas and district heating sectors until 2020.

The Legal Framework for Energy Efficiency is outdated and mainly includes legislative documents developed during the 1990s. There have been some recent amendments to the legislative framework. Still, most efforts of the GoA are devoted to the development of new laws according to the best international practice. The Law on the Use of Energy Resources is the key document regulating energy efficiency. The law defines the legal, economic and social foundation of state policy and governs the relations between different entities in this area. However, not all provisions of the law have been reinforced since its adoption in 1996. The MoEn is currently in the process of adopting a new Energy Efficiency Law with the support of the EU4Energy project.

There is no National Energy Efficiency Action Plan (NEEAP) in Azerbaijan. However, once adopted, the new Law on Energy Efficiency (EE) will require the development of a five-year NEEAP. Therefore, in 2019, the MoEn started developing the NEEAP with the support of the EU4Energy project. In 2011 and 2015, there were also attempts to develop state EE programmes, but neither document was adopted.

The institutional framework for energy efficiency includes multiple stakeholders and the MoEn is the leading responsible authority for the development and implementation of energy policies related to energy efficiency, renewable energy and environmental protection. However, there is a lack of coordination of EE-related activities in industry, buildings and transport sectors.

Renewable Energy Policy

Due to its geographical location, the Caspian Sea and its diverse landscape of plains and mountains, Azerbaijan has significant potential to utilise its renewable energy sources (RES). The highest technical potential belongs to solar (23 GW) and wind (3GW), but the country also has good potential for small hydro (0.5GW) and biomass (0.4GW).

The SRM on Public Utilities envisages specific targets for the installation of new RES capacities by 2020. At the same time, the document does not specify any targets for small hydro. In 2019, the country exceeded its target for bioenergy, but needs to make extra effort to achieve its solar and wind-installed capacity targets. There are no specific

targets for RES development beyond 2020 and they should be part of the long-term energy strategy being developed with the support of EU.

There is no regulatory framework for the development of RES in Azerbaijan, aside from specific purchase tariffs for electricity produced from alternative and renewable energy sources. The Presidential Decree on "The Acceleration of Reforms in the Energy Sector of Azerbaijan" assigns specific responsibilities to the MoEn for the development of RES law and for creating a favourable climate for private investments in renewables. To fulfil its assigned obligations, the MoEn actively cooperates with donor organisations and international companies. Namely, the Ministry collaborates with the EU on the development of the RES legislative framework, the EBRD on the Implementation of Renewable Energy Auctions and the Asian Development Bank (ADB) on the construction of the first floating solar photovoltaic (PV) plant.

Environmental and Climate Change Policies Related to Energy

In October 2016, the Parliament of Azerbaijan ratified the Paris Agreement with the country's commitment to reduce greenhouse gas (GHG) emissions by 35% in 2030 compared to the base year 1990. The state submitted its Second Biennial Update Report to the United Nations Framework Convention on Climate Change (UNFCCC) in 2018. According to the report, Azerbaijan needs to reduce its total emissions by 23% or net emissions by 16% to reach the 2030 targets. The difference between total and net emission targets relates to the forest and biodiversity restoration achievements of the government during 1990–2013.

A more profound analysis indicates that the significant reduction of total emission was related to the economic shutdown after the collapse of the Soviet Union in 1991 and the fuel switch from oil to natural gas in the energy generation sector. This means that the country still needs to make extra efforts to decouple its economic growth and energy consumption to reach its GHG targets by 2030.

As of 2019, there is no official action plan on the activities aimed at achieving GHG targets. The Ministry of Ecology and Natural Resources, together with the United Nations Development Programme (UNDP), is currently working to prepare its Third Biennial Report and a national action plan to meet its intended nationally determined contributions (INDC) targets.

Finance and International Assistance

The EU is the largest provider of financial assistance to Azerbaijan in the energy sector. This support is mainly based on the EU-Azerbaijan Partnership and Cooperation Agreement and the EaP policy initiative.

The identified dynamics of the low enforcement of policy reforms in EE and RES fields completely changed in 2017, when the Government of Azerbaijan initiated major energy reforms. The new impetus to tackle energy markets, sustainable energy and climate change challenges contributed to negotiations over a new framework agreement on mutually beneficial cooperation between the EU and Azerbaijan. The new agreement is also related to the development of the Shah Deniz Stage 2 gas production field and the Southern Gas Corridor that can additionally deliver ten bcma of gas to the EU market. Funding for these projects was in part provided by the EU financial institutions European

Investment Bank (EIB) and EBRD. By securing 3.9 billion euros, the TAP became the largest European infrastructure project in 2018.

As of 2019, Azerbaijan is a part of the EU4Energy initiative, which supports the improvement of energy supply, connectivity, promotion of energy efficiency and the use of renewables. The Government of Azerbaijan also cooperates with ADB, the United States Agency for International Development (USAID) and other international financial institutions and donor organisations in the energy field.

Recommendations

Recommendations

General Recommendations

1. Prioritise the development and approval of a long-term energy strategy. Such a strategy should include ambitious but realistic long-term quantitative targets and attainable objectives for EE and demand-side management. The strategy should also recognise EE as one of the priorities for meeting and reducing future energy demand, increasing energy export revenues and other benefits as a result of achieving long-term EE targets. In this framework, the strategy should also include the 'energy efficiency first' principle.
2. Prioritise the approval of the draft EE law and the timely adoption of the NEEAP and other legislative acts envisaged by the law. Continue ongoing efforts on the development of an energy-related legislative framework according to the Presidential Decree on "The Acceleration of Reforms in the Energy Sector of Azerbaijan".
3. Take action to improve the enforcement of planned energy efficiency policies and measures stipulated by the draft EE law, such as:
   - Define clear responsibilities and strengthen the coordination of EE policy development between different stakeholders;
   - Strengthen capacity and provide necessary resources to the authority responsible for the implementation of EE policy in the country. It might be advantageous to establish an entity on the basis of the existing Department of Energy Efficiency and Ecology of the Ministry of Energy or a new entity responsible for the implementation of EE policy under the Ministry. The possibility of separating the policy development, policy implementation and policy evaluation functions of the Department or a new entity under the Ministry should be analysed and assessed. An enforcement function should also be ensured.
   - Ensure effective feedback loops by improving coordination between the development, implementation and the evaluation of energy efficiency policy, energy sector strategy development and energy system planning. Develop internal communication rules in order to widely disseminate monitoring and evaluation results, including via the Internet.
   - The Energy Efficiency Fund, envisaged by the draft EE law, needs to be separated from the general state budget and ideally should be based on stable revenue streams e.g. tariff increases (public benefit charge), environmental taxes (e.g. transport fuels) or revenue received from exporting energy resources saved as a result of the implementation of EE measures. The EE Fund can also be appointed as the key authority for the implementation of EE policies, programmes and measures.
4. Establish a clear baseline, management information and benchmarking system in the EE field. This in-depth energy efficiency report can serve as a baseline for the monitoring and evaluation of future progress in implementing EE reforms.
5. Approve and implement new energy tariff methodologies supporting the efficient use of energy, including specific focus on the following provisions:
   - Clear incentive for energy utilities to reduce their operational costs;
   - Further improvement of the existing electricity tariff design in order to stimulate the efficient use of the existing electricity system, i.e. introduce prices depending on voltage and capacity, time-of-use pricing for all consumers, critical peak pricing, etc.

6. Enhance awareness of decision makers, civil servants and other stakeholders as to the multiple benefits that EE measures can bring to Azerbaijani society, i.e. the creation of new jobs, attracting new investments, increased exports, etc., using real evidence and case studies.

Recommendations: Energy Sector

7. Conduct further reforms supporting functional unbundling and the development of electricity market, taking into consideration EE. Introduce competition in the electricity generation market and develop an efficient regulatory framework, incentivising optimal capacity distribution among power plants in Azerbaijan in order to ensure the most reliable and efficient balance of electricity demand and supply.
8. Prioritise the reduction of specific fuel consumption and power plants' own use. Introduce incentives for the management and the staff of the plant to improve overall plant efficiency and reduce fuel consumption. Increase transparency and regularly publish data on key performance indicators of the power-generating sector (see Recommendation 13).
9. Introduce specific long-term targets aimed at improving the efficiency of energy transformation, the reduction of losses in electricity, natural gas and heat networks.
10. Develop and approve a methodology for ancillary services. Network operators can be required to encourage demand side, like aluminium and other heavy industry plants, to participate in ancillary service market.
11. Adopt policy measures to promote a wider application of high-efficient cogeneration and/or efficient district heating and cooling systems. Conduct cost-benefit analysis for the application of high-efficient cogeneration for installing new or refurbishing existing electricity generating units with a total thermal input exceeding 20 MW.
12. Initiate the development of a heat map that should include existing district heating capacities and waste heat from industry and power generation sector. Use the heat map for the planning and development of district heating/cooling systems and the efficient utilisation of waste heat.
13. Maintain efforts to improve national energy statistics, including the following:
    - Improve the availability of statistics on natural gas losses with regard to the separation of transmission and distribution losses;
    - Improve the availability of detailed statistical information on the energy sector's own use, dividing this indicator into own use of the power plants (as one of the main energy saving indicators of power plants) and final consumption by energy industry sub-sectors;
    - Introduce new statistical information on key performance indicators of power-generating plants;
    - Align electricity balance terminology with best international practices (i.e. the use of correct terminology for combined cycle power plants (CCPPs), thermal power plant (TPPs) and combined heat and power plants (CHPs) in energy balances);
    - Expand recently introduced EE indicators to all sectors of the economy and add indicators based on physical outputs per sector.

Recommendations: Industry

14. Define clear responsibilities for the development and implementation of policy measures targeting EE in industry (see Recommendation 3), including in small and medium-sized enterprises (SMEs). Provide sufficient resources for managing the following key policy measures:
    - Mandatory energy audits for large industrial enterprises on a regular basis;
    - Incentives for SMEs to carry out energy audits on a regular basis;
    - Energy audit and training/certification schemes for energy auditors;
    - Energy management standards and certification procedures;
    - Financial incentives to encourage the implementation of EE improvements.
15. Prioritise the adoption and the implementation of ecodesign requirements for industrial appliances. Start with the introduction of ecodesign requirements for products that are less technically complex and contentious, but that can potentially bring the highest energy savings for industry, such as power transformers, water pumps and electric motors.
16. Initiate the development of benchmarking studies on technical and economic EE potential in the industrial sector in general and strategic sub-sectors in particular.
17. Develop support programmes to promote energy audits among SMEs, i.e. tax exemption or direct financial incentives to support the implementation of EE measures based on the results of the conducted energy audit, awareness-raising campaigns, etc.
18. Develop support mechanisms for local producers of modern EE equipment. The support mechanisms can include new incentive measures, subsidised loans, tax exemptions, etc.
19. Promote voluntary agreements and other industrial initiatives to stimulate EE in the industry. Support business initiatives targeting improvements in EE, including fiscal incentives for EE improvements and Energy Service Company (ESCO) schemes.

Recommendations: Buildings

20. Define clear responsibilities for the development and implementation of policy measures targeting energy performance in buildings (see Recommendation 3). Provide sufficient resources for managing the following key policy measures:
    - Minimum energy performance requirements (MEPRs);
    - Energy performance certificates and certification procedures;
    - Financial incentives to encourage improvements in energy performance;
    - Public procurement criteria related to EE to be applied to public buildings.
21. Promote the exemplary role of the public sector with regard to building renovation. Prioritise the implementation of EE measures in public and state-owned buildings. Introduce specific sub-targets for improving efficiency in buildings.
22. Introduce MEPRs for buildings based on overall energy performance (kWh/m^2/year). Gradually make more stringent MEPRs to achieve nearly zero-energy buildings.
23. Design the Energy Performance Certification scheme as a self-funding mechanism, where the revenue from issuing Energy Performance Certificates covers all costs related to its management and quality assurance. Design the Energy Performance Certificates' software in such a way that the collected information on buildings' energy performance is automatically available for the State Statistics Committee of Azerbaijan and for a wider decision-making process.

24. Initiate the development of a study on the potential use of solar thermal systems in Azerbaijan. Evaluate the potential of solar thermal systems to contribute to the electricity system's development in a more cost-effective way compared to the supply-side option. Based on the results of the study, develop a supporting mechanism for the installation of solar thermal systems in residential and service sectors. Evaluate the costs of running this support scheme against the multiple benefits for the Azerbaijani economy, creation of jobs, increase of investments, increase of electricity exports, decrease of electricity consumption during peak hours and investments in network reinforcement, etc. Consider opportunities for the creation of additional incentives for local producers of solar water heating systems.
25. Introduce incentives for local authorities and the owners of public buildings to reduce energy consumption and implement EE measures. Local authorities should be allowed to use energy savings for the repayment of investment in EE and, once the debt has been repaid, to keep the energy savings each year.
26. Initiate the development of a study on technical and economic EE potential in residential buildings. Conduct targeted campaigns to improve consumers' awareness of their historical energy consumption and promote no-cost or low-cost measures to reduce their energy bills. Ensure that consumers have easy access to information about their historical consumption (up to a three-year period). Conduct awareness-raising campaigns on no-cost and low-cost measures to reduce energy bills based on international best practices and promoted nationwide.

Recommendations: Energy-using Products

27. Define clear responsibilities for the development and implementation of policy measures targeting the EE of energy-using products (see Recommendation 3). Provide sufficient resources for managing the following key policy measures:
    - Import ban on incandescent light bulbs;
    - Ecodesign regulations;
    - Energy labelling regulations;
    - EE criteria in public procurement procedures.
28. Prioritise the adoption and the implementation of ecodesign and energy labelling requirements, as one of the highest impact EE policy measures to achieve future EE targets. Start with the introduction of ecodesign requirements for products that are less technically complex and contentious and that can potentially bring the highest energy savings for residential consumers, such as heaters, air conditioners, dishwashers, washing machines and televisions.
29. Consider raising consumer awareness through information campaigns on energy labelling to inform consumers of the benefits and money they could save.
30. Enhance the capacity of involved stakeholders on the efficient implementation of ecodesign and energy labelling compliance, enforcement and market surveillance. Strengthen the cooperation and coordination of activities between all involved stakeholders (see Recommendation 3).
31. Provide general support and assistance to facilitate a higher uptake of highly efficient products and appliances. Develop targeted awareness-raising campaigns to enhance consumers' awareness of the benefits of using more energy-efficient appliances.

Recommendations: Transport

32. Assign clear responsibilities to a relevant governmental authority/department for the overall control and implementation of EE measures in the transport sector. Provide sufficient resources for managing such responsibilities (see Recommendation 3).
33. Introduce fleet management strategies in state authorities and state-owned companies;
34. Promote modal shift, in particular the use of public transport by improving its comfort, accessibility and affordability. Explore the cost benefits of adding new routes and creating dedicated road space for buses so that they can avoid traffic jams, particularly in tourist destinations. Promote sustainable transport, including subway and other electric means of public transport. Promote railway transport and an obligation for airport and airline companies to promote public transport travel to and from airports. Promote the use of bicycles, the development of specific bicycle lines and the use of electrical scooters.
35. Promote rail and maritime transport means for cargo transportation.
36. Explore options to restrict or influence vehicle imports to favour vehicles that are more fuel efficient and of lower emissions (i.e. hybrid, liquefied natural gas, liquefied petroleum gas), taking advantage of the improving fuel efficiency and emissions performance of the EU market.
37. Conduct targeted campaigns to promote measures related to behavioural changes, including eco-driving, car-sharing and proper vehicle maintenance. Introduce ecodriving as part of driver's licence study and tests.

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İcmal

Ümumi məlumat

Azərbaycan Respublikası (Azərbaycan) 1991-ci ildə öz müstəqilliyini bərpa etdikdən sonra regionda energetika sahəsində əsas oyunçuya çevrilmiş enerji ehtiyatları ilə zəngin ölkədir. Ölkə ərazisi 86 600 km^2 təşkil edir və Rusiya, Gürcüstan, İran, Türkiyə və Ermənistanla sərhəddir. Azərbaycanın təxminən 10 milyon əhalisi var və ölkə əhalisinin 53%-i şəhər ərazilərində məskunlaşmışdır. Coğrafi mövqeyinə görə dünyada mövcud olan 11 iqlim tipinin 8-i Azərbaycanda yerləşir. Azərbaycan alıcılıq qabiliyyəti paritetinə (AQP) görə adambaşına düşən 17 460 dollar (hazırkı ABŞ dolları) ilə orta həddən yuxarı gəlir səviyyəsinə malik ölkədir. Bu göstərici 2017-ci ildə Avropa İttifaqına üzv 28 ölkədə mövcud göstəricinin orta hesabla 43%-ni təşkil etmişdir.

Neft ixracı ölkənin iqtisadi inkişafı üçün əsas gəlir mənbəyi olmuşdur ki, bu da ölkənin qlobal neft qiymətləri üzrə xarici təsirlərə və dəyişikliklərə həssas olmasına gətirib çıxarmışdır. Azərbaycan hökuməti qeyri-neft sektorunu inkişaf etdirmək üçün ciddi təşəbbüslər həyata keçirmişdir. Bunun nəticəsində ÜDM-də iqtisadiyyatın qeyri-neft sektorunun payı 2008-ci ildə 38%-dən 2017-ci ildə 57%-ə qalxmışdır.

2017-ci ildə ÜDM-ni formalaşdıran bütün fəaliyyətlərin üçdə biri neft və təbii qazın istehsalı ilə bağlı olmuşdur. Halbuki, iqtisadi fəal əhalinin 1%-dən daha aşağı hissəsi bu sektorda fəaliyyət göstərir. Eyni zamanda, iqtisadi fəal əhalinin 37%-i kənd təsərrüfatı sektoruna cəlb olunmuşdur ki, bu da ÜDM-yə 6% töhfə vermişdir. Elektrik enerjisinin, təbii qazın və istilik enerjisinin daşınması, paylanması və saxlanılması ÜDM-yə 1% töhfə vermiş və iqtisadi fəal əhalinin 5%-i bu sahələrdə çalışmışdır. 2017-ci ildə işsizlik səviyyəsi 5% olmuşdur.

2008-2017-ci illərdə bütün enerji investisiyalarının təxminən 90%-i karbohidrogenlərin çıxarılması, 9%-i isə bərpa olunan enerji mənbələri də daxil olmaqla, elektrik enerjisi sektorunun inkişafı ilə bağlı olmuşdur. Təbii qazın və istilik enerjisinin paylanması və təchizatı sektorlarına qoyulmuş investisiyalar digər enerji alt-sektorlarına qoyulan investisiyalar ilə müqayisədə daha az əhəmiyyətli olmuşdur. Azərbaycan 2019-cu ildə "Ease of Doing Business" reytinqində 190 ölkə arasında 25-ci sırada yer almaqla, MDB ölkələri arasında liderdir.

2007-2016-cı illərdə Azərbaycanda enerji istehlakı hər 2011 min dollar alıcılıq qabiliyyəti pariteti üzrə 14%, yaxud 0.105 ton neft ekvivalentindən 0.090 ton neft ekvivalentinə düşmüşdür. Bu demək olar ki Avropa İttifaqının enerji istehlakı ilə eyni dinamikanı göstərmişdir. Ölkənin enerji istehlakı göstəricisi Şərq Tərəfdaşlığı (ŞT) regionunda ən aşağı göstəricidir.

Enerji təchizatı və tələbat

Azərbaycan böyük neft və qaz istehsalçısı və xalis enerji ixracatçısıdır. Ölkə 2008-2017-ci illərdə istehsal olunmuş bütün enerjinin orta hesabla 77%-ni ixrac etmişdir. Xam neft ən çox ixrac edilən məhsul olmuş və 2017-ci ildə xam neft ümumi ixracın 78%-ni, təbii qaz 19%-ni digər enerji daşıyıcıları isə 3%-ni təşkil etmişdir. Azərbaycan 2008-2017-ci illərdə 12%-ə qədər artmış daxili enerji tələbatını qarşılamaq üçün karbohidrogendən də istifadə etmişdir. Kommunal xidmət və nəqliyyat sektorlarındakı istehlakçılar son on illikdə əsas enerji istehlakçıları olmuşdur. 2017-ci ildə bərpa olunan enerjinin payı ümumi əsas enerji təchizatının 1.66%-nı təşkil etmiş və əsasən hidro-elektrik stansiyaları ilə təmsil olunmuşdur.

Azərbaycanda nüvə və kömür elektrik stansiyaları yoxdur. Elektrik enerjisinin istehsalı üçün əsas mənbə təbii qazdır. 2008-2017-ci illərdə ölkənin ümumi istehsal gücü 37%-ə qədər artmış və təhlil edilmiş dövrün sonunda təxminən 8 QVt olmuşdur. Eyni dövr ərzində elektrik enerjisinin istehsalı 12%-ə qədər artmışdır. 2017-ci ildə qaz ilə işləyən elektrik stansiyaları və hidro elektrik stansiyaları müəyyən olunmuş ümumi gücün müvafiq olaraq 85%-ni və 14%-ni təşkil etmiş, istehsal olunmuş ümumi elektrik enerjisinin isə 92% və 7%-ini təşkil etmişdir.

2017-ci ildə Azərbaycan özünün sübut olunmuş neft ehtiyatlarına görə dünyada 20-ci sırada, neft istehsalına görə isə 23-cü sırada yer tutmuşdur. Neft istehsalı 2010-cu ildə pik həddə çatmış və həmin dövrdən etibarən aşağı düşmüşdür. Daxili bazarda neft məhsullarının istehlakı son on ildə 45%-ə qədər artmışdır. Hər iki amil 2011-2017-ci illərdə xam mal və neft məhsullarının ixracının kəskin azalması ilə nəticələnmişdir.

2017-ci ildə ölkə eyni zamanda təbii qaz ehtiyatlarına görə dünyada 27-ci yerdə, təbii qaz istehsalına görə isə 32-ci yerdə olmuşdur. Azərbaycanın tarixən neft istehsalçısı olmasına baxmayaraq, regionda qaz istehsalçısı və ixracatçısı kimi də əhəmiyyəti artır. Təbii qazın ixracı 2008-ci ildə ümumi istehsalda 32.2%-dən 2017-ci ildə 48.7%-ə qalxmışdır. Xarici bazarlarda tələb və təchizat üzrə hazırkı disbalansı aradan qaldırmaq üçün Azərbaycan təbii qazı idxal etməyə başlamış və 2016-cı ildə qaz üzrə idxal həcmi 1.6%-dən 2017-ci ildə 11.6%-ə yüksəlmişdir. Bəzi struktur dəyişikliklərinə baxmayaraq, 2017-ci ildə daxili bazarda təbii qazın ümumi istehlakı demək olar ki, 2008-ci ildəki səviyyə ilə eyni olmuşdur.

Azərbaycanda istilik enerjisinin istehsalı üzrə əsas mənbə təbii qazdır. Son on ildə istilik enerjisinin istehsalında və istehlakında ciddi dəyişikliklər (fluktuasiyalar) olsa da, 2017-ci ildə istilik enerjisinin istehsal səviyyəsi 2008-ci il ilə müqayisədə cəmi 6% çox olmuşdur.

Elektrik enerjisi, təbii qaz və istilik enerjisi üzrə bazar strukturu

2015-ci ildə həyata keçirilmiş islahatlardan sonra Azərbaycanın elektrik enerjisi bazarı ölkənin böyük hissəsində fəaliyyət göstərən dövlətə-məxsus 2 təbii inhisarçı şirkətdən, o cümlədən dövlətə-məxsus və özəl istehsalçılardan ibarət olmuşdur. "Azərenerji" ASC elektrik enerjisinin ötürülməsi üzrə sistem operatoru (ÖSO) və istehsal olunmuş bütün enerjinin 85%-nə sahib olmaqla, ən böyük elektrik enerjisi istehsalçısıdır. Azərbaycanın böyük hissəsində elektrik enerjisinin paylanması və təchizatı vəzifələri "Azərişıq" ASC-yə həvalə edilmişdir. Ölkənin blokadaya alınmış ərazisində elektrik enerjisinin istehsalı, ötürülməsi, paylanması və təchizatı Naxçıvan Muxtar Respublikasının (MR) Dövlət Energetika Xidməti tərəfindən həyata keçirilir. Ümumilikdə, 57 stansiyadan 50-i, yaxud bütün istehsal gücünün 91.5%-i dövlətə məxsus şirkətlərə aiddir. Təbii qaz istehsal gücünün 82%-i üçün əsas mənbədir. Böyük hidro-elektrik stansiyaları ümumi istehsal gücünün 15.5%-ni, hidro-elektrik stansiyaları və bərpa olunan enerji mənbələri isə 1.8%-ni təşkil edir.

Azərbaycan Respublikası Dövlət Neft Şirkəti (ARDNŞ) digər fəaliyyətlərlə yanaşı təbii qazın tədqiqatına, çıxarılmasına, ötürülməsinə, paylanmasına və təchizatına cəlb olunmuş dövlətə məxsus inhisarçı şirkətdir. Azərbaycanda təbii qazın çıxarılması əsasən Xəzər dənizinin dərin sulu şelfində yerləşən Şah Dəniz ərazisində mərkəzləşmişdir. Bu sahənin gələcək inkişafı ilə Cənubi Qafqaz, Trans Anadolu (TANAP) və Trans-Adriatik (TAP) boru kəmərləri layihələri vasitəsilə Türkiyəyə ildə 6 milyard kub metr, Avropa İttifaqı ölkələrinə isə ildə 10 milyard kub metr qaz verə bilər.

İstilik enerjisinin istehsalı, paylanması və təchizatı vəzifələri "Azəristiliktəchizat" ASC-yə həvalə edilmişdir. Şirkət 2005-ci ilin iyun ayında yaradılmışdır və hal-hazırda Azərbaycanın

63 inzibati rayonundan 51-də fəaliyyət göstərir. Əlaqədar istehlakçıların sayında son zamanlarda artım olmasına baxmayaraq, Azərbaycanda yaşayış binalarının 3%-dən daha azının mərkəzi istilik xidmətlərinə çıxışı var.

Enerji qiymətinin müəyyən olunması siyasəti

Azərbaycanda enerji tariflərinin təsdiq edilməsi üzrə aparıcı məsul qurum Tarif Şurasıdır. 2019-cu ilin yanvar ayında Şuranın Katibliyinin dövlət büdcəsindən maliyyələşdirilməsi rəsmi şəkildə dayandırılmışdır. Şura bütün əlaqədar dövlət qurumlarının könüllü iştirakı əsasında fəaliyyət göstərir. Enerji Məsələlərini Tənzimləmə Agentliyi Energetika Nazirliyinin tabeliyində 2017-ci ilin dekabr ayında publik hüquqi şəxs kimi yaradılmışdır. AYİB-in dəstəyi ilə hazırlanmaqda olan tənzimləmə haqqında ilkin qanun layihəsinin qəbul edilməsindən sonra enerji tariflərinin hesablanması və təsdiqlənməsi üzrə bütün funksiyalar EMTA-ya həvalə edilməlidir.

2008-2017-ci illərdə Azərbaycanda elektrik enerjisi üzrə tariflər nisbətən stabil olmuş, tarif qiymətlərində və strukturunda cəmi 3 əsas dəyişiklik olmuşdur. Sonuncu dəyişikliklər kommunal sektordakı istehlakçılar üçün güzəştli tariflərin tətbiq edilməsi və alternativ və bərpa olunan enerji mənbələrindən istifadə etməklə enerji istehsalçılarından əldə olunan alış qiymətlərinin azaldılması ilə bağlı olmuşdur.

2016-cı ilin dekabr ayında elektrik enerjisi üzrə aylıq tarif limiti 250 kVt·saatdan - 300 kVt·saata qədər artırılmışdır.

Elektrik enerjisinə bənzər surətdə, təbii qaz üzrə tariflər də nisbətən stabil olmuşdur. Tarif siyasətindəki sonuncu dəyişikliklər də dəyişməyə meyilli güzəştli tariflərin tətbiq edilməsi ilə bağlı olmuşdur. 2016-cı ilin dekabr ayında limit illik 1500 m^3-dən 1700 m^3-ə qaldırılmış və daha sonra 2019-cu ilin may ayında 2200 m^3-ə qaldırılmışdır.

Son on il ərzində mərkəzləşdirilmiş istilik enerjisinin təchizatı tariflərində dəyişikliklər olmamışdır. İsti su ilə bağlı tariflərin dövlət tərəfindən tənzimlənən tariflərin (qiymətlərin) siyahısından çıxarılmasından sonra "Azəristiliktəchizat" Səhmdar Cəmiyyəti 2017-ci ilin yanvar ayında isti su tariflərini demək olar ki, 5 dəfə qaldırmışdır. Qiymətlərin əhəmiyyətli dərəcədə artırılmasına baxmayaraq, isti su üzrə tariflər xərcləri əks etdirən səviyyədən aşağıdır.

Tarif sistemi istehlakçı qrupları və enerji daşıyıcıları arasında sahələrarası çarpaz subsidiyaların, o cümlədən dövlət büdcəsindən birbaşa subsidiyaların verilməsini nəzərdə tutur. Xərcləri əks etdirməyən enerji tarifləri ölkənin sosial siyasətinin bir hissəsidir. Qiymət boşluğunun təhlili ilə bağlı nəticələr, orta ixrac qiyməti və qonşu ölkələrə ixrac üzrə alternativ xərclər onu göstərir ki, 2015-2017-ci illərdə elektrik enerjisi, təbii qaz və istilik istehlakçılarına verilən birbaşa subsidiyaların dəyəri 3.2 milyard ABŞ dollarından çox olmuşdur. Azərbaycandakı enerji tarifləri regionda ən aşağı tariflər arasındadır.

Enerji və enerji səmərəliliyi siyasəti

2019-cu il tarixinə Azərbaycanda enerji strategiyası yoxdur, lakin Energetika Nazirliyi uzunmüddətli enerji strategiyasının hazırlanması üçün artıq Avropa İttifaqı ilə əməkdaşlığa başlayıb. İslahatların həyata keçirilməsi və tənzimləyici çərçivənin yenilənməsi üçün əsas sənəd "Azərbaycan Respublikasının energetika sektorunda islahatların sürətləndirilməsi" haqqında Prezident Sərəncamıdır. Sərəncam müvafiq ilkin normativ hüquqi aktların hazırlanması və təqdim edilməsi üzrə məsul qurumları və işin icrası üzrə zəruri olan son tarixləri nəzərdə tutur.

Milli iqtisadiyyat və iqtisadiyyatın əsas sektorları üzrə strateji yol xəritələrinin təsdiq edilməsi haqqında Azərbaycan Respublikası Prezidentinin 6 dekabr 2016-cı il tarixli Fərmanı ilə 12 strateji yol xəritəsi qəbul edilmişdir. (SYX). Bunlardan ən əsası "Azərbaycan Respublikasının milli iqtisadiyyat perspektivi üzrə Strateji Yol Xəritəsi". Bundan əlavə 11 sektoru əhatə edən yol xəritələri də var ki, bunlardan energetika sektoru ilə bağlı olanları "Azərbaycan Respublikasının neft və qaz sənayesinin (kimya məhsulları daxil olmaqla) inkişafına dair Strateji Yol Xəritəsi" və "Kommunal xidmətlərin inkişafına (elektrik və istilik enerjisi, su və qaz) dair Strateji Yol Xəritəsi"dir. Kommunal xidmətlərin inkişafına dair Strateji Yol Xəritəsi bərpa olunan enerji mənbələri, təbii qaz və mərkəzləşdirilmiş istilik təchizatı sektorları da daxil olmaqla, elektrik enerjisi üzrə 2020-ci ilə qədər həyata keçirilməli xüsusi hədəfləri nəzərdə tutur.

Enerji səmərəliliyi ilə bağlı hüquqi çərçivə köhnədir və əsasən 1990-cı illərdə hazırlanmış qanunvericilik sənədlərini ehtiva edir. Son zamanlarda hüquqi çərçivəyə bəzi əlavələr edilmişdir. Hökumətin təşəbbüslərinin çoxu hələ də ən uğurlu beynəlxalq təcrübəyə uyğun yeni qanunların hazırlanması ilə bağlıdır. Enerji səmərəliliyini tənzimləyən əsas sənəd "Enerji resurslarından istifadə haqqında" Azərbaycan Respublikasının Qanunudur. Qanun dövlət siyasətinin hüquqi, iqtisadi və sosial bazasını müəyyən edir və bu sahədə müxtəlif qurumlar arasındakı əlaqələri tənzimləyir. Bununla belə, 1996-cı ildə qəbul edildikdən sonra qanunun bütün müddəaları tətbiq edilməmişdir. Energetika Nazirliyi hal-hazırda "EU4Energy" layihəsinin dəstəyi ilə enerji səmərəliliyi haqqında yeni qanunun qəbul edilməsi prosesindədir.

Energetika Nazirliyi 2019-cu ildə "EU4Energy" layihəsi çərçivəsində Enerji Səmərəliliyi üzrə Milli Fəaliyyət Planının hazırlanmasına başlamışdır.

Enerji səmərəliliyi üzrə təşkilati çərçivəyə müxtəlif maraqlı tərəflər daxildir. Enerji səmərəliliyi, bərpa olunan enerji mənbələri və ətraf mühitin qorunması üzrə enerji qaydalarının hazırlanmasına və həyata keçirilməsinə görə məsul əsas qurum Energetika Nazirliyidir. Buna baxmayaraq, sənaye, tikinti və nəqliyyat sektorlarında enerji səmərəliliyi ilə bağlı fəaliyyətlərin əlaqələndirilməsində çatışmazlıq var.

Bərpa olunan enerji mənbələri üzrə strategiya

Coğrafi mövqeyinə, Xəzər dənizi sahilində yerləşməsinə, düzənliklərin və dağların rəngarəng landşaftına görə, Azərbaycan bərpa olunan enerji mənbələrindən (BOEM) istifadə üzrə əhəmiyyətli potensiala malikdir. Ən çox texniki potensial günəş (23 qiqavatt) və külək (3 qiqavatt) enerjisinə məxsusdur, lakin ölkədə kiçik hidro (0.5 qiqavatt) və biokütlə (0.4 qiqavatt) enerjisinin əldə olunması üçün də potensial var. Kommunal xidmətlərlə bağlı Strateji Yol Xəritəsi 2020-ci ilə qədər bərpa olunan enerji mənbələri üzrə yeni elektrik stansiyalarının quraşdırılması üçün konkret hədəflər nəzərdə tutur. Eyni zamanda, sənəddə kiçik hidroelektrik stansiyaları üzrə hər hansı bir hədəf müəyyən edilməmişdir.

Alternativ və bərpa olunan enerji mənbələrindən istehsal olunmuş elektrik enerjisi üzrə xüsusi alış tarifləri istisna olmaqla, Azərbaycanda bərpa olunan enerji mənbələrinin inkişafına dair tənzimləyici çərçivə yoxdur. "Azərbaycan Respublikasının energetika sektorunda islahatların sürətləndirilməsi" üzrə Prezident Sərəncamı bərpa olunan enerji mənbələri haqqında qanunun hazırlanması və bərpa olunan enerji mənbələri üzrə özəl investisiyalar üçün əlverişli mühitin yaradılması məqsədilə Energetika Nazirliyinə xüsusi öhdəliklər həvalə edilmişdir. Təyin olunmuş öhdəlikləri yerinə yetirmək üçün Energetika Nazirliyi donor təşkilatlar və beynəlxalq şirkətlərlə fəal şəkildə əməkdaşlıq edir. Belə ki, Nazirlik bərpa olunan enerji mənbələri haqqında qanunvericilik çərçivəsinin hazırlanması

üçün Avropa İttifaqı ilə, bərpa olunan enerji mənbələri üzrə hərracların keçirilməsi üçün Avropa Yenidənqurma və İnkişaf Bankı ilə və Üzən günəş elektrik stansiyasının quraşdırılması üçün Asiya İnkişaf Bankı ilə əməkdaşlıq edir.

Enerji ilə əlaqədar ekoloji və iqlim dəyişikliyinə dair qaydalar

2016-cı ilin oktyabr ayında Azərbaycan Respublikasının Milli Məclisi istixana effekti yaradan qazların emissiyasının 1990-cı illə müqayisədə 2030-cu ildə 35%-ə qədər azaltmaq ilə bağlı ölkə üzrə öhdəlik götürərək Paris Sazişini təsdiq etdi. Ölkə yeniliklərlə bağlı ikinci iki illik hesabatını 2018-ci ildə iqlim dəyişikliyi ilə bağlı BMT-nin Çərçivə Konvensiyasına təqdim etmişdir. Hesabata əsasən, Azərbaycan 2030-cu il üzrə müəyyən olunmuş hədəflərə çatmaq üçün istixana qazlarının ümumi emissiyasını 23%-ə qədər, yaxud xalis emissiyanı 16%-ə qədər azaltmalıdır. Ümumi və xalis emissiya hədəfləri arasındakı fərq 1990-2013-cü illər ərzində hökumətin meşə və biomüxtəlifliyin bərpası istiqamətində əldə etdiyi nailiyyətlərlə bağlıdır.

Daha təfərrüatlı təhlil onu göstərir ki, istixana effekti yaradan qazların ümumi emissiyasının əhəmiyyətli dərəcədə azalması 1991-ci ildə Sovet İttifaqının dağılmasından sonra iqtisadi böhran və enerji istehsalı sektorunda yanacağın neftdən təbii qaza keçməsi ilə bağlı olmuşdur. Bu o deməkdir ki, ölkə 2030-cu ilə qədər istixanaeffekti yaradan qazların emissiyası ilə bağlı hədəfə çatmaq üçün öz iqtisadi inkişafını və enerji istehlakını şaxələndirmək üçün əlavə təşəbbüslər göstərməlidir.

2019-cu ildə istixana effekti yaradan qazların emissiyası ilə bağlı hədəflərə çatmağı məqsəd qoyan fəaliyyətlər üzrə rəsmi Fəaliyyət Planı olmamışdır. Ekologiya və Təbii Sərvətlər Nazirliyi hal-hazırda Birləşmiş Millətlər Təşkilatının İnkişaf Proqramı ilə birlikdə "Nəzərdə tutulan milli səviyyədə müəyyən edilmiş töhfələrdə" göstərilmiş hədəflərə çatmaq üçün üçüncü iki illik hesabatın və Milli Fəaliyyət Planının hazırlanması üzərində işləyir.

Maliyyə dəstəyi və beynəlxalq dəstək

Enerji sektorunda Azərbaycana ən böyük maliyyə dəstəyi təmin edən qurum Avropa İttifaqıdır. Bu dəstək əsasən Aİ-Azərbaycan Tərəfdaşlıq və Əməkdaşlıq Sazişi və Şərq Tərəfdaşlığı proqramı çərçivəsində həyata keçirilir.

Enerji səmərəliliyi və bərpa olunan enerji mənbələri sahəsində iqtisadi islahatların aşağı səviyyədə tətbiqi ilə bağlı müəyyən olunmuş dinamika 2017-ci ildə Azərbaycan hökumətinin əsas enerji islahatlarını başlatması ilə tamamilə dəyişdi. Enerji bazarları, dayanıqlı enerji və iqlim dəyişiklikləri ilə bağlı çətinliklərin öhdəsindən gəlmək üçün yeni stimulun olması Aİ ilə Azərbaycan arasında qarşılıqlı faydalı əməkdaşlıq üzrə yeni çərçivə sazişinə dair danışıqların başlanılmasına töhfə verdi. Yeni saziş eyni zamanda Şah Dəniz Mərhələ 2 layihəsi çərçivəsində qaz istehsalının artırılması və cənub qaz dəhlizinin açılması ilə bağlıdır. Bu layihə Aİ bazarına əlavə 10 milyard kub metr qaz çatdıra bilər. Bu layihələrin maliyyələşdirilməsi də Aİ-nin maliyyə institutları, yəni Avropa İnvestisiya Bankı və Avropa Yenidənqurma və İnkişaf Bankı tərəfindən təmin edilmişdir. 3.9 milyard avro təmin etməklə, TAP layihəsi 2018-ci ildə ən böyük Avropa infrastruktur layihəsi olmuşdur.

2019-cu ildə Azərbaycan enerji təchizatının, elektrikləşdirmənin yaxşılaşdırılmasını, enerji səmərəliliyinin və bərpa olunan enerji mənbələrindən istifadənin təşviq edilməsini dəstəkləyən "EU4Energy" təşəbbüsünün bir hissəsidir. Azərbaycan hökuməti enerji sahəsində eyni zamanda Asiya İnkişaf Bankı, ABŞ Beynəlxalq İnkişaf Agentliyi və digər beynəlxalq maliyyə institutları və donor təşkilatlarla əməkdaşlıq edir.

Ümumi Tövsiyələr

Ümumi Tövsiyələr

1. Energetika sektorunun uzunmüddətli inkişaf Strategiyasının hazırlanması və təsdiqlənməsi prioritet fəaliyyət istiqamətləri kimi müəyyənləşdirilməsi. Bu Strategiyaya enerji səmərəliliyi (ES) və tələbat yönümlü idarəetmə üçün ambisiyalı, lakin reallığı əks etdirən uzunmüddətli kəmiyyətlə ifadə olunmuş hədəflər və nail olunması mümkün məqsədlər daxil edilməlidir. Strategiya, həmçinin uzunmüddətli ES hədəflərinə nail olma nəticəsində gələcək enerji tələbatının qarşılanmasını, azaldılmasını, enerji ixracı gəlirlərinin artırılması və digər faydalar üçün enerji səmərəliliyini prioritetlərdən biri kimi tanımalıdır. Bu çərçivədə Strategiyaya 'əvvəlcə enerji səmərəliliyi' prinsipi də daxil edilməlidir.
2. ES haqqında qanun layihəsinin təsdiqlənməsini və ESMFP-nin və qanunda nəzərdə tutulmuş digər qanunvericilik aktlarının vaxtında qəbul edilməsini prioritet kimi qəbul edilməsi. Azərbaycan Respublikasının energetika sektorunda islahatların sürətləndirilməsi haqqında Azərbaycan Respublikası Prezidentinin Sərəncamına əsasən energetika ilə bağlı qanunvericilik bazasının inkişafı istiqamətində cari səylərin davam etdirilməsi.
3. Planlaşdırılan enerji səmərəliliyi siyasətlərinin və ES haqqında qanun layihəsində nəzərdə tutulmuş tədbirlərin icrasını yaxşılaşdırmaq üçün bu kimi tədbirlərin görülməsi:
   - Vəzifələri aydın müəyyənləşdirmək və müxtəlif maraqlı tərəflər arasında ES siyasətinin işlənib hazırlanmasının əlaqələndirilməsi;
   - Ölkədə ES siyasətinin həyata keçirilməsinə cavabdeh olan orqanın bacarıqlarını gücləndirilməsi və lazımi resurslarla təmin edilməsi. Energetika Nazirliyinin mövcud Enerji səmərəliliyi və ekologiya şöbəsinin əsasında struktur vahidin və ya Nazirliyin tabeliyində ES siyasətini həyata keçirən yeni qurumun yaradılması əlverişli ola bilər. Şöbənin və ya Nazirliyin tabeliyində yeni qurumun siyasətin müəyyənləşdirilməsi, həyata keçirilməsi və qiymətləndirilməsi funksiyalarının ayrılması təhlil olunmalı və qiymətləndirilməlidir. İcra funksiyası da təmin edilməlidir.
   - Enerji səmərəliliyi siyasətinin, energetika sektoruna dair strategiyanın və enerji sisteminin planlaşdırılmasının işlənib hazırlanması, icrası və qiymətləndirilməsi arasında əlaqələndirməni yaxşılaşdırmaqla effektiv rəy bildirmə zəncirinin yaradılmasının təmin edilməsi. Monitorinq və qiymətləndirmə nəticələrini geniş yaymaq üçün (o cümlədən internet vasitəsilə) daxili məlumatlandırma qaydalarını işləyib hazırlanması
   - ES haqqında qanun layihəsində nəzərdə tutulan Enerji Səmərəliliyi Fondu ümumi dövlət büdcəsindən ayrılmalı və ideal olaraq sabit gəlir axınları, yəni tarif artımı (ictimai rifah haqqı), ətraf mühit vergiləri (məsələn, nəqliyyat yanacağı) və ya ES tədbirlərinin həyata keçirilməsi nəticəsində qənaət olunan enerji resurslarının ixraca yönəldilməsindən əldə olunan gəlirlər əsasında maliyyələşməlidir. ES Fondu, həmçinin ES siyasətlərinin, proqramlarının və tədbirlərinin həyata keçirilməsində əsas orqan kimi təyin edilə bilər.
4. ES sahəsində aydın bazis xətti, idarəetmə məlumatları və etalon müqayisə sistemin yaradılması. Bu dərin enerji səmərəliliyi hesabatı ES islahatlarının həyata keçirilməsində gələcək irəliləyişin monitorinqi və qiymətləndirilməsi üçün bazis xətti rolunu oynaya bilər.
5. Enerjidən səmərəli istifadəni dəstəkləyən və aşağıdakı müddəalara xüsusi diqqət yetirən yeni enerji tarifi metodologiyalarını təsdiqlənməsi və icra edilməsi:
   - Enerji kommunal xidmət müəssisələrinin öz istismar xərclərini azaltmağa təşviq edəcək stimullaşdırıcı mexanizmlər;

- Mövcud elektrik sistemindən səmərəli istifadəni stimullaşdırmaq üçün hazırki elektrik enerjisinin tarifi strukturunu daha da təkmilləşdirmək, yəni bütün istehlakçılar üçün gərginlik və gücdən asılı olan qiymətlərin, istifadə vaxtına görə qiymətlərin tətbiqi; pik saatlarda istifadəyə görə qiymətlər və s.

6. Real sübutlardan və praktiki nümunələrdən istifadə edərək qərar qəbul edən rəsmilərin, dövlət qulluqçularının və digər maraqlı tərəflərin ES tədbirlərinin Azərbaycan cəmiyyətinə verə biləcəyi çoxsaylı faydaları, başqa sözlə yeni iş yerlərinin yaradılması, yeni investisiyaların cəlb edilməsi, ixrac potensialının artırılması və s. kimi müsbət təzahürlər barədə məlumatlılığın artırılması.

Tövsiyələr: Energetika Sektoru

7. Enerji səmərəliliyi nəzərə alınmaqla, elektrik enerjisi bazarının funksional ayrılmasını və inkişafını dəstəkləyən növbəti islahatların aparılması. Elektrik enerjisi istehsalı bazarında rəqabəti tətbiq edilməsi və elektrik enerjisinə tələbat və təklifin etibarlı və ən səmərəli balanslaşdırılmasını təmin etmək üçün Azərbaycanda elektrik stansiyaları arasında optimal güc paylanmasını stimullaşdıran səmərəli tənzimləmə bazasını işləyib hazırlanması.
8. Şərti yanacaq sərfini və elektrik stansiyalarının xüsusi sərfiyyat göstəricilərinin azaldılmasını prioritet kimi qəbul edilməsi. Stansiyanın ümumi səmərəliliyini artırmaq və yanacaq istehlakını azaltmaq məqsədilə rəhbərlik və işçilər üçün stimullaşdırıcı mexanizmlər tətbiq edilməsi. Şəffaflığı artırılması və elektrik enerjisinin istehsalı sektorunun əsas fəaliyyət göstəriciləri barədə məlumatları mütəmadi olaraq dərc edilməsi (bax Tövsiyə 13).
9. Enerji çevrilməsinin (transformasiya prosesləri) səmərəliliyinin artırılması, elektrik enerjisi, təbii qaz və istilik şəbəkələrində itkilərin azaldılması məqsədi ilə konkret uzunmüddətli hədəflərin müəyyən edilməsi.
10. Köməkçi xidmətlər üçün metodologiyanın işlənib hazırlanması və təsdiq edilməsi. Şəbəkə operatorlarının üzərinə, məsələn alüminium və digər ağır sənaye zavodları timsalında istehlakçıların köməkçi xidmətlər bazarında tələbatın tənzimləməsində iştirak etməsini təşviq etmək vəzifəsi qoyula bilər.
11. Yüksək səmərəli kogenerasiya və / və ya səmərəli mərkəzləşdirilmiş istilik və soyutma sistemlərinin daha kütləvi tətbiqini təşviq etmək məqsədilə siyasi tədbirlərini qəbul edilməsi. İstilik qucu 20 MVt-dan çox olan yeni elektrik enerjisi generasiya qurğularının quraşdırılması və ya yenidən qurulması üçün yüksək səmərəli kogenerasiya modelinin tətbiqi məqsədilə xərc-fayda təhlilin aparılması.
12. Mövcud mərkəzləşdirilmiş istilik güclərini, habelə sənaye və elektrik enerjisi istehsalı sektorunun istilik enerjisinin tullantılarını daxil edən istilik xəritəsinin hazırlanması. Rayon istilik/soyutma sistemlərinin planlaşdırılması və inkişafı, eləcə də tullanan istiliyin səmərəli istifadəsi üçün istilik xəritəsindən istifadə edilməsi.
13. Milli energetika statistikasının təkmilləşdirilməsi istiqamətində aşağıdakılar da daxil olmaqla cari fəaliyyətləri davam etdirilməsi:
    - Ötürücü və paylayıcı şəbəkələrdə itkilərin ayrılmasına xüsusi diqqət yetirməklə təbii qaz itkisi ilə bağlı statistikanın mövcudluğunu yaxşılaşdırmaq;
    - Energetika sektorunun daxili sərfiyyatı ilə bağlı detallı statistik məlumatların mövcudluğunu yaxşılaşdırmaq, bu göstəricini elektrik stansiyalarının xüsusi sərfiyyatına (elektrik stansiyalarının əsas enerjiyə qənaət göstəricilərindən biri kimi) və energetika sektorunun alt sektorlarının son istehlak göstəricisinə bölünməsi;

- Elektrik enerjisini istehsal edən stansiyalarının əsas fəaliyyət göstəriciləri haqqında yeni statistik məlumatlar təqdim edilməsi;
- Elektrik enerjisi balansı üzrə terminologiyasını ən yaxşı beynəlxalq təcrübələrə uyğunlaşdırılması: elektrik stansiyalarının növü üçün (QBES, İES , İEM və s.) düzgün terminologiyanın istifadəsi;
- Bu yaxınlarda tətbiq olunmağa başlayan ES göstəricilərini iqtisadiyyatın bütün sahələrinə yayılması və hər sektora fiziki nəticələrə əsaslanan göstəricilər əlavə edilməsi.

Tövsiyələr: Sənaye

14. Kiçik və orta müəssisələr daxil olmaqla, sənayedə ES-nə yönəlmiş siyasət tədbirlərinin hazırlanması və icrası üçün vəzifələri aydın müəyyənləşdirmək (bax Tövsiyə 3). Aşağıdakı əsas siyasi tədbirlərinin idarəedilməsi üçün yetərli resurslarla təmin edilməsi:
    - İri sənaye müəssisələri üçün müntəzəm olaraq icbari enerji auditləri;
    - Kiçik və orta müəssisələrin enerji auditinin müntəzəm olaraq aparılması üçün stimul;
    - Enerji auditorları üçün enerji auditi və təlim/sertifikatlaşdırma sxemləri;
    - Enerji Menecmenti Standartları və sertifikatlaşdırma prosedurları;
    - ES –nin inkişafının icrasını həvəsləndirmək üçün maliyyə təşviqləri.
15. Sənaye avadanlıqları/cihazları üçün ekoloji dizayn tələblərinin qəbul edilməsini və icrasını prioritet kimi qəbul edilməsi. Ekoloji dizayn tələblərini texniki cəhətdən daha az mürəkkəb və mübahisəli olan, misal üçün güc transformatorları, su nasosları və elektrik mühərrikləri kimi sənaye sahələri üçün enerjiyə maksimum qənaətə imkan verən məhsullara tətbiq etməklə başlanması.
16. Ümumilikdə sənaye sektorunda və xüsusilə də strateji alt-sektorlarda texniki və iqtisadi enerji səmərəliliyi potensialı üzrə müqayisəli tədqiqatların işlənib hazırlanmasına başlanması.
17. KOM-lar arasında enerji auditlərini təşviq etmək məqsədilə dəstək proqramları, yəni aparılan enerji auditinin nəticələri əsasında ES tədbirlərini dəstəkləmək üçün vergi azadolmaları və ya birbaşa maliyyə təşviqləri, məlumatlılıq səviyyəsinin artırılması kampaniyaları və s. tədbirlərin hazırlanması.
18. Müasir ES avadanlıqlarının yerli istehsalçılarına dəstək mexanizmləri hazırlamaq. Dəstək mexanizmlərinə yeni stimullaşdırıcı tədbirlər, subsidiya aşağı faizli kreditlər, vergi güzəştləri və s. daxil ola bilər.
19. Sənayedə enerji səmərəliliyinin stimullaşdırılması üçün könüllü müqavilələri və digər sənaye təşəbbüslərini təşviq edilməsi. Enerji səmərəliliyinin yüksəldilməsi üçün maliyyə stimulları və ESCO sxemləri daxil olmaqla, enerji səmərəliliyinin yüksəlməsinə yönəlmiş işgüzar təşəbbüslərə dəstək verilməsi.

Tövsiyələr: Binalar

20. Binalarda enerji effektivliyinə yönəlmiş siyasi tədbirlərinin işlənib hazırlanması və icrası üçün aydın vəzifə bölgüsünün aparılması (bax Tövsiyə 3). Aşağıda sadalanan əsas siyasi tədbirlərini idarə etmək üçün yetərli resurslarla təmin edilməlidir:
    - Minimum enerji istehlakına dair tələblər;
    - Enerji effektivliyi sertifikatları və sertifikatlaşdırma prosedurları;
    - Enerji effektivliyinin yüksəldilməsini təşviq etmək üçün maliyyə stimulları.
    - İctimai binalara tətbiq edilən enerji səmərəliliyi ilə əlaqədar dövlət satınalma meyarları.

21. Binanın abadlaşdırılması ilə əlaqədar dövlət sektorunun nümunəvi rolunu təşviq edilməsi. İctimai və dövlətə məxsus binalarda ES tədbirlərinin icrasını prioritet kimi qəbul edilməsi. Binalarda səmərəliliyi artırmaq üçün xüsusi alt-hədəflərin müəyyən edilməsi.
22. Ümumi enerji effektivliyi (kVts/m^2/il) əsasında binalar üçün Minimum Enerji Effektivliyi Tələblərini (MEET) tətbiq edin. Sıfıra yaxın enerjili binalara nail olmaq üçün tədricən daha sərt MEET-lər tətbiq edilməsi.
23. Özünü maliyyələşdirmə mexanizmi kimi Enerji Effektivliyinin Sertifikatlaşdırma Sxemini tərtib edilməsi - burada Enerji Effektivliyi Sertifikatlarının verilməsindən əldə edilən gəlir onun idarə edilməsi və keyfiyyət təminatı ilə bağlı bütün xərcləri ödəyir. Enerji Effektivliyi Sertifikatları üzrə proqram təminatını elə tərtib edilməlidir ki, binaların enerji effektivliyi barədə toplanmış məlumatlar Azərbaycan Dövlət Statistika Komitəsi və daha geniş müstəvidə qərar qəbul etmə prosesi üçün əlçatan olsun.
24. Azərbaycanda günəş istilik sistemlərinin mümkün istifadəsi ilə bağlı araşdırmaların hazırlanmasına başlanması. Günəş istilik sistemlərinin elektrik enerjisi sisteminin inkişafına töhfə vermə potensialını təchizat yönlü seçimlə müqayisə etməklə iqtisadi cəhətdən daha sərfəli şəkildə qiymətləndirmək. Tədqiqatın nəticələrinə əsasən yaşayış və xidmət sektorlarında günəş istilik sistemlərinin quraşdırılması üçün dəstəkləyici mexanizm işləyib hazırlanması. Bu dəstək sxeminin tətbiqinə çəkilən xərcləri Azərbaycan iqtisadiyyatı üçün çoxsaylı faydalarla, iş yerlərinin açılması, investisiyaların artması, elektrik enerjisinin ixracının yüksəlməsi, pik saatlarda elektrik enerjisi istehlakının azalması və şəbəkənin gücləndirilməsinə qoyulan investisiyalarla və s. ilə qarşılaşdıraraq qiymətləndirilməsi. Günəş su isitmə sistemlərinin yerli istehsalçıları üçün əlavə stimulların yaranması imkanlarını nəzərə alınması.
25. Enerji istehlakını azaltmaq və enerji səmərəliliyi tədbirlərini icra etmək məqsədilə yerli hakimiyyət orqanları və ictimai binaların sahibləri üçün təşviqedici mexanizmlərin tətbiq edilməsi. Yerli hakimiyyət orqanlarına ES-nə qoyulan investisiyaların geri ödənilməsi üçün enerjiyə qənaət faydalarından istifadə etməyə və borc ödənildikdən sonra hər il enerjiyə qənaət hesabına əldə edilən vəsaiti özündə saxlamağa imkanın yaradılması.
26. Yaşayış binalarında texniki və iqtisadi enerji səmərəliliyi potensialına dair araşdırmanın hazırlanmasına başlanması. İstehlakçıların əvvəlki dövrlərdə elektrik enerjisi istehlakı haqqında və elektrik enerjisi qaimələrinə görə ödənişləri azaltmağa imkan verən xərcsiz və ya az xərc tələb edən tədbirlər barədə məlumatlılığını artırmaq məqsədilə hədəf qruplara yönəlmiş kampaniyaların aparılması. İstehlakçıların əvvəlki dövrlərə aid istehlak göstəriciləri (üç illik müddətə qədər) barədə asanlıqla məlumat əldə etmələrini təmin edilməsi. Elektrik enerjisi qaimələrinə görə ödənişləri azaltmağa imkan verən xərcsiz və ya az xərcli tədbirlər haqqında maarifləndirmə kampaniyaları beynəlxalq mütərəqqi təcrübələr əsasında aparıla və ölkə səviyyəsində təbliğ oluna bilər.

Tövsiyələr: Enerji istehlakı ilə əlaqədar məhsullar

27. Elektrik enerjisindən istifadə edən məhsulların enerji səmərəliliyinə yönəlmiş siyasi tədbirlərinin işlənib hazırlanması və icrası üçün aydın vəzifə bölgüsünün aparılması (bax Tövsiyə 3). Aşağıda sadalanan əsas siyasi tədbirləri idarəedilməsi yetərli resurslarla təmin edilməlidir:
    - Közərmə işıqlandırma lampalarının idxalına qadağa qoyulması;
    - Ekoloji dizayn (ekodizayn) qaydalarının işlənib hazırlanması;

- Enerji istehlakı ilə əlaqədar etiketlənməsi qaydaları;
- Dövlət satınalmaları prosedurlarında enerji səmərəliliyi meyarları.

28. Gələcək ES hədəflərinə çatmaq üçün ən yüksək təsirə malik ES siyasəti tədbirlərindən biri kimi ekodizayn və enerji istehlakı ilə əlaqədar məhsulların etiketlənməsi tələblərinin qəbul edilməsini və icrasını prioritet istiqamət kimi qəbul edilməsi. Texniki cəhətdən daha az mürəkkəb və mübahisəli olan və yaşayış binalarındakı istehlakçılar üçün enerjiyə maksimum qənaət imkanı verən məhsullar (isidicilər, kondisionerlər, qabyuyan maşınlar, paltaryuyan maşınlar və televizorlar) ekodizayn tələblərinin tətbiqindən başlanması.
29. Əldə olunacaq faydalar və qənaət ediləcək pullar barədə məlumatlandırmaq məqsədilə enerji etiketlənməsi ilə bağlı məlumatlandırma kampaniyaları keçirməklə istehlakçıların maarifləndirməsini nəzərdən keçirmək.
30. Cəlb olunmuş maraqlı tərəflərin ekodizayn və enerji istehlakı ilə əlaqədar məhsulların etiketlənməsi tədbirlərini, uyğunluğu və bazar araşdırmalarını səmərəli həyata keçirməsi üçün zəruri bacarıqlarını gücləndirilməsi. Cəlb olunmuş bütün maraqlı tərəflər arasında əməkdaşlığı və fəaliyyətlərin əlaqələndirilməsinin gücləndirilməsi (bax Tövsiyə 3).
31. Yüksək səmərəlilik göstəricilərinə malik məhsul və cihazların daha kütləvi tətbiqini asanlaşdırmaq üçün ümumi dəstək və yardımın göstərilməsi. Son istehlakçıların enerjiyə maksimum qənaət edən cihazlardan istifadənin faydaları barədə məlumatlılığını artırmaq üçün hədəf kütlələrə yönəlmiş maarifləndirici kampaniyalar hazırlanması.

Tövsiyələr: Nəqliyyat

32. Nəqliyyat sektorunda enerji səmərəliliyi tədbirlərinə ümumi nəzarət və bu tədbirlərin icrası üçün müvafiq dövlət orqanı / şöbəsinin üzərinə düşən vəzifələrin aydın müəyyən edilməsi. Belə vəzifələrin idarəedilməsi üçün yetərli resurslarla təmin edilməlidir (bax Tövsiyə 3).
33. Dövlət orqanlarında və dövlət şirkətlərində nəqliyyat vasitələri parkının idarəetmə strategiyasını tətbiq edilməsi;
34. Yeni modellərə keçidin, xüsusilə ictimai nəqliyyatın rahatlığını, əlçatanlığını və əlverişliliyini artıraraq ictimai nəqliyyatdan istifadənin təşviq edilməsi. Yeni marşrut xətlərinin əlavə olunmasının və xüsusilə turizm məkanlarında tıxacların qarşısını almaq məqsədilə avtobuslar üçün xüsusi hərəkət zolaqlarının yaradılmasının faydalarını araşdırılması. Dayanıqlı və ətraf mühitə dost nəqliyyat növlərini, o cümlədən metro və digər elektrik ictimai nəqliyyat vasitələrinin təşviq edilməsi. Dəmiryolu nəqliyyatının təşviq edilməsi, eləcə də hava limanı və hava yolları şirkətlərini öz müştərilərini hava limanına / əks istiqamətə gedərkən ictimai nəqliyyatdan istifadəyə həvəsləndirməsi. Velosipedlərin istifadəsini, xüsusi velosiped zolaqlarının yaradılmasını və elektrik skuterlərinin istifadəsini təşviq edilməsi.
35. Yük daşınmaları üçün dəmir yolu və dəniz nəqliyyat vasitələrini təşviq edilməsi.
36. Avropa İttifaqı bazarında yanacaq səmərəliliyi və emissiya effektivliyinin yaxşılaşdırılması təcrübəsindən faydalanaraq yanacaq səmərəliliyi daha yüksək və aşağı emissiyalı (yəni, hibrid, LNG, LPG) avtomobillərin idxalını stimullaşdırmaq, bu tələblərə cavab verməyən avtomobillərin idxalına qadağa qoyulması və ya buna təsir göstərilməsi.
37. Eko-sürüş, avtomobil mübadiləsi və nəqliyyat vasitələrinə düzgün texniki qulluq daxil olmaqla, davranış modellərinin dəyişdirilməsi ilə əlaqəli tədbirlərin təşviqi üçün ünvanlı kampaniyaların aparılması. Sürücülük vəsiqəsinin alınması təlimlərində və test imtahanlarının bir hissəsi kimi eko-sürüş vərdişlərini tətbiq edilməsi.

1. Background

1. Background

1.1. Country Overview

Figure 1: Map of Azerbaijan

Source: UN Cartographic Section: Azerbaijan, 2011

The Republic of Azerbaijan (Azerbaijan) is an energy-rich country that has evolved from a struggling newly independent state to a major regional energy player over the past decades. The country is located at the crossroads of major trade and energy routes between East and West and enjoys its natural bridge role between Europe and Asia (Figure 1). Azerbaijan restored its independence from the Soviet Union on 18 October 1991 and declared itself the political and legal successor of the Azerbaijan Democratic Republic of 1918.

Azerbaijan's territory covers an area of 86,600 sq. km and borders the Caspian Sea to the east, Russia to the north, Georgia to the north-west, Iran to the south and Turkey and Armenia to the west. Baku, the capital, has the largest harbour on the Caspian Sea and has long been the centre of the country's oil industry. Due to its geographical position, the Caspian Sea and its diverse landscape of plains and mountains, the territory of Azerbaijan includes eight out of 11 existing climate zones.[1]

The Constitution of Azerbaijan, which was adopted on 12 November 1995, identifies Azerbaijan as a democratic, constitutional, secular and unitary republic. Power in Azerbaijan is divided into legislative, executive and judicial powers. The president is the head of state. The legislative power is held by Milli Majlis, the parliament of the country. Executive power is carried out by the president, while judicial power is held by the courts of the Republic of Azerbaijan.

1 http://www.conference.ach.gov.az/index.php?page=9 (accessed June 2019).

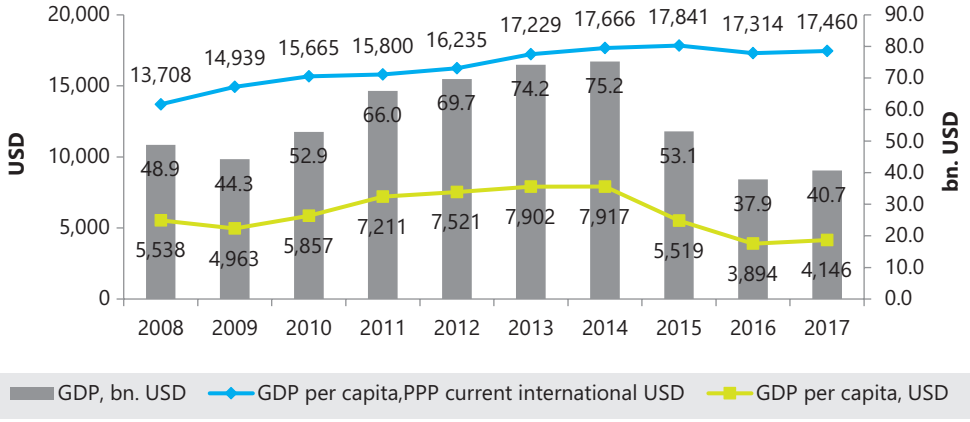
As of January 2018, Azerbaijan had a population of about 9.89 million, 52.9% of whom resided in urban areas.[2] Baku is the biggest city in the country, with 2.26 million inhabitants as well as the highest population density at 1,057 persons per sq. km. Azerbaijan enjoys a young demographic profile, with some 24.1% of the population aged between 14 and 29 years old and only 6.3% at retirement age.[3] The country's economically active population was about 5.1 million in 2017.[4]

1.2. Economic Background

Overview

Azerbaijan is an upper-middle income country, with a gross domestic product (GDP) per capita at purchasing power parity (PPP, current international USD) of 17,460, which is 42.5% of the EU 28 average (Figure 2)[5]. Figure 2 also shows that the GDP per capita in current international USD reached a high point of 7,917 USD in 2014, but decreased to 3,894 USD in 2016, the lowest indicator since 2007 due to the devaluation of the national currency, the Azerbaijani manat (AZN).

Figure 2: Dynamics of GDP (bn. USD) and GDP per capita (USD) in 2008–2017



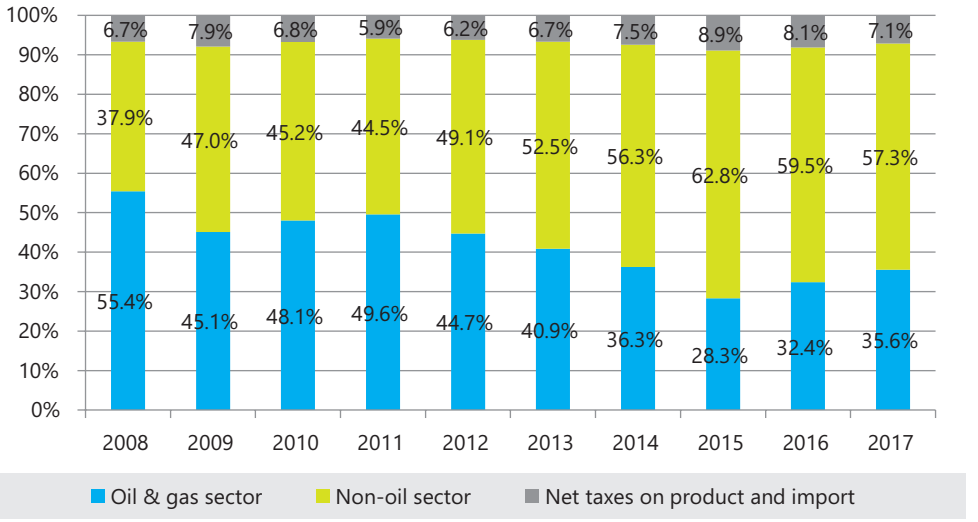
Source: United Nations, Population Division, 2019 &
World Bank, International Comparison Program database, 2019

Oil exports have constituted the main revenue source for the economic development of the country over the past decades, rendering the country vulnerable to external shocks and changes in global oil prices. For example, the drop in oil prices in 2014 resulted in the significant shrinking of the country's economy and the devaluation of the manat from 2014 to 2016. According to the World Bank, Azerbaijan's GDP halved from $75.2 billion in 2014 to just under $37.9 billion in 2016 (Figure 2).

2 https://www.stat.gov.az/menu/6/buklet/azerbaycan_faktlar_ve_reqemler_2018.pdf (accessed August 2019).
3 https://www.stat.gov.az/source/demoqraphy/?lang=en (accessed August 2019).
4 https://www.stat.gov.az/source/labour/?lang=en (accessed August 2019).
5 United Nations, Department of Economic and Social Affairs, Population Division: https://population.un.org/wpp/ (accessed June 2019) & World Bank, International Comparison Program database: https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD (accessed June 2019).

As a result, the Government of Azerbaijan devoted many efforts to developing its non-oil sector, leading to an increase in the non-oil share of the economy in GDP from 37.9% in 2008 to 57.3% in 2017 (Figure 3).[6] At the same time, oil exports through the Baku-Tbilisi-Ceyhan, the Baku-Novorossiysk and the Baku-Supsa pipelines remain the main economic driver. Efforts to boost Azerbaijan's gas production are also underway. The expected completion of the geopolitically important Southern Gas Corridor between Azerbaijan and Europe will open up another source of revenue from gas exports. It is expected that 10 billion cubic metres of natural gas will be transported to the EU each year, starting in 2020.[7]

Figure 3: Breakdown of GDP into oil and gas and non-oil sectors of the economy in 2008–2017, %



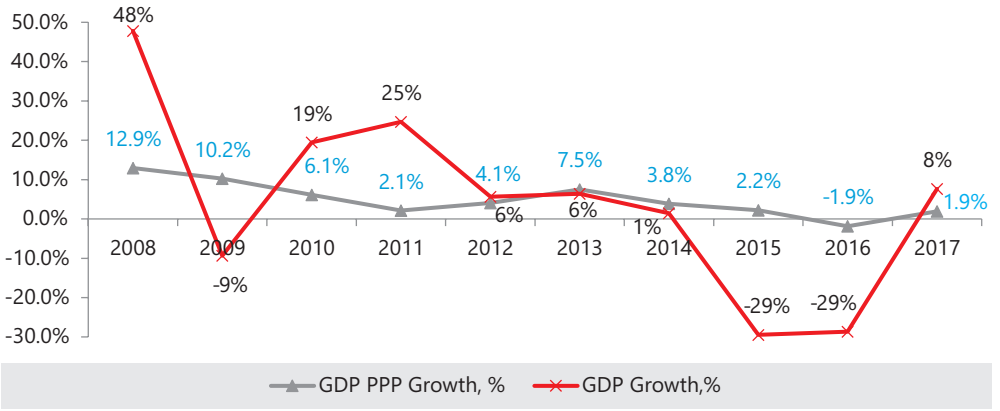
Source: State Statistics Committee, 2019

GDP and growth

Figure 4 indicates that prior to the sharp decrease in oil prices in 2014, the Azerbaijani economy was characterised by rapid growth (48% in 2008, 19% in 2010 and 25% in 2011). This was mainly related to the increase in oil sector revenue due to the increase of both oil prices and oil production during 2008–2011 (see Figure 16). The reduction of oil production during 2011–2013 resulted in the slowing down of economic growth to 6%, but in 2014 it plummeted to 1%. The significant decrease in oil prices led to the shrinkage of the economy by 29% per year both in 2015 and 2016. At the same time, analysis of GDP purchasing power parity (PPP) growth indicates that this was growing from 1.9% to 12.9% during the whole period analysed except for in the year 2016.

6 https://economy.gov.az//uploads/fm/files/diger/2018%20sosial-iqtisadi.pdf (accessed August 2019).
7 https://www.dw.com/en/azerbaijans-economic-miracle-hits-snags-after-oil-boom/a-43339470 (accessed June 2019).

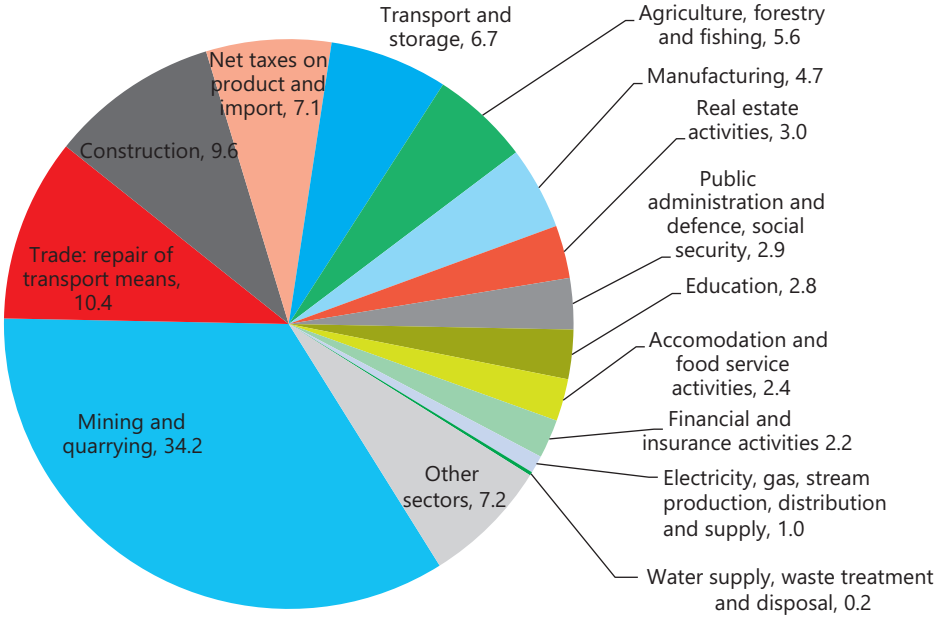
Figure 4: GDP growth, %



Source: World Bank, International Comparison Program database, 2019

In 2017, the major GDP-generating activities of the country were mining (34.2%), trade and repair of transport means (10.4%), construction (9.6%), transportation and storage (6.7%) and agriculture 5.6% (Figure 5).[8] Electricity, gas, stream production, distribution and supply and water supply, waste treatment and disposal accounted for 1% and 0.2%, respectively.

Figure 5: Breakdown of GDP by economic activities in 2017, %



Source: State Statistics Committee, 2019

8 https://www.azstat.org/MESearch/details (accessed August 2019).

At the same time, the sectors that employed significant shares of the employed population in 2017 were: agriculture, forestry and fishing (36.4%), trade and repair of transport means (14.6%), education (7.8%), construction (7.2%) and public administration (5.9%).[9] In contrast, mining, the major GDP-generating sector, employed only 0.8% of the employed population. Transportation and storage on the one hand and electricity, gas, stream production and distribution on the other employed 4.2% and 0.6%, respectively.

Labour market

The overall economic progress of the country has significantly contributed to the development of the labour market and the efficient use of the labour force in recent decades. This has been reflected in the distribution of employment by state and non-state sectors as well as in the unemployment rate itself. According to the data of the State Statistics Committee (SSC), the share of persons employed in the state sector decreased from 30.3% of persons engaged in the economy in 2005 to 24.0% in 2017.

2.45 million persons or 50.7% of the total employed population were engaged in production fields (agriculture and fishing, industry, construction) and the number of persons employed in the field of service was 2.38 million persons, measuring 49.3% of the employed population. The total number of unemployed people was 251,700 or 5% of the labour market in 2017, slightly less than 252,800 unemployed people in 2016.[10]

Imports and exports

Azerbaijan had 30.9 billion USD of foreign trade turnover in 2018. The country's exports were valued at about 19.5 billion USD, while the value of imports was 11.5 billion USD, resulting in an 8 billion USD positive balance of foreign trade. The main export partner was Italy (30%), followed by Turkey (9.4%), Israel (6.7%), Czech Republic (4.8%) and India (4.2%). The main import partners for the same period were Russia (16.4%), Turkey (13.8%), China (10.4%), Germany (5.8%) and the United States (4.6%).[11]

Mineral fuels, oil and their products dominate Azerbaijan's foreign trade relations, representing more than 90% of overall exports. In contrast, the main import commodities are machines, mechanisms, electrical appliances, equipment and their parts (22.6%), food products (12%) and ferrous metals and their products (10.5%).[12]

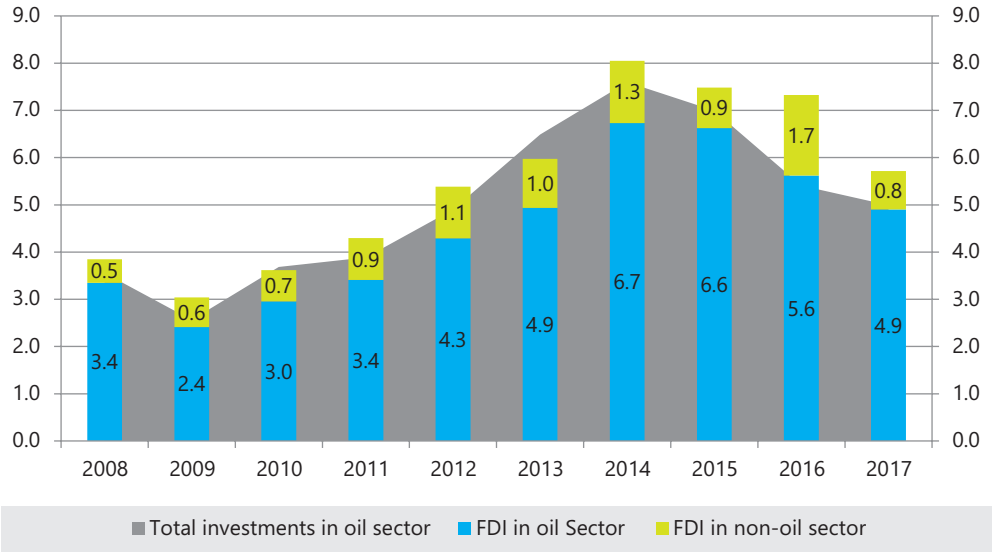
Foreign direct investment

According to the 2018 United Nations Conference on Trade and Development (UNCTAD) World Investment Report,[13] Azerbaijan's inward foreign direct investment (FDI) fluctuated at the level of 4.0-4.5 billion USD during 2014–2016 and dropped to 2.9 billion in 2017. The level of outward FDI was about 3.2 billion USD in 2014–2015 and dropped to 2.6 billion USD in 2016 and 2017.

At the same time, Figure 6 compares the dynamics of FDI in oil and non-oil sectors as well as total investment in oil sectors provided by the National Statistic Committee of Azerbaijan.

9 Labour Market, the State Statistical Committee, https://www.stat.gov.az/source/labour/?lang=en (accessed July 2019).
10 https://www.stat.gov.az/source/labour/?lang=en (accessed August 2019).
11 https://economy.gov.az//uploads/fm/files/diger/Xarici%20ticar%C9%99t_2018.pdf (accessed August 2019).
12 http://customs.gov.az/modules/pdf/pdffolder/71/FILE_44C1D3-FD03FF-A9A62A-0678E5-8898EF-88787F.pdf (accessed August 2019).
13 World Investment Report 2018 and UNCTAD FDI/MNE database, https://unctad.org/Sections/dite_dir/docs/WIR2018/wir18_fs_az_en.pdf (accessed June 2019).

Figure 6: FDI in oil and non-oil sectors and total investment in oil sector in 2008–2017, bn. USD



Source: State Statistics Committee, 2019

Figure 6 illustrates that more than 90% of investments in the oil sector were FDI over the last decade and were mainly targeted at the extraction of crude oil and natural gas. A more detailed analysis of total investment in energy sector is provided in Table 1 below.

Energy sector development and investment

Table 1 shows that during 2008–2017, almost 90% of all energy investments were related to the extraction of hydrocarbons, 9% to the development of the electricity sector and about 1% to oil refineries. The shares of investment in natural gas and heat distribution and supply were insignificant compared with other energy sectors.

Investment conditions

Azerbaijan is ranked 25th out of 190 economies in terms of ease of doing business, according to the latest World Bank annual ratings, topping the CIS countries (Figure 7). This is also the second-best rank after Georgia among the EaP countries. In total, Azerbaijan rebounded 32 spots compared with its 57th rank in the previous report.

In Europe and Central Asia, Azerbaijan implemented eight reforms to make it easier to do business in 2017/18, the highest number among the 10 top improvers and globally. Several of these reforms involved institutional changes. Azerbaijan improved its ranking on a number of parameters, including dealing with construction permits and getting electricity. As for the latter, the Doing Business 2019 report specifically highlighted the efforts of the government related to improvements in the reliability of the country's electricity supply as well as speeding up and reducing costs for connecting consumers to the grid by establishing a single window.[14]

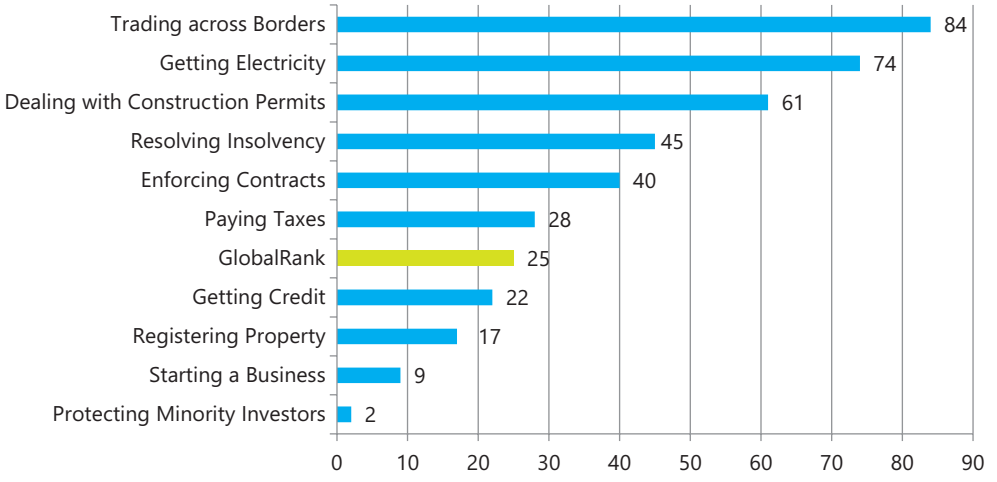
14 https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB2019-report_web-version.pdf (accessed July 2019).

Table 1: Investment to fixed capital in energy sector in 2008–2017, bn. USD[15]

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1. Extraction of crude oil and natural gas	3.50	2.52	3.65	3.83	4.86	6.46	7.56	6.98	5.35	4.94
% of total	82%	81%	87%	79%	86%	91%	93%	96%	95%	90%
2. Oil refinery	0.05	0.04	0.03	0.06	0.04	0.03	0.04	0.02	0.06	0.05
% of total	1%	1%	1%	1%	1%	0%	1%	0%	1%	1%
3.1. Electricity production, distribution and supply	0.58	0.49	0.50	0.96	0.66	0.55	0.50	0.27	0.23	0.51
% of total	13%	16%	12%	20%	12%	8%	6%	4%	4%	9%
3.2. Gas processing, distribution and supply	0.14	0.06	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00
% of total	3%	2%	0%	0%	1%	0%	0%	0%	0%	0%
3.3. Steam production, distribution and supply	0.02	0.02	0.02	0.02	0.03	0.05	0.03	0.01	0.00	0.00
% of total	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%
Total	4.29	3.12	4.21	4.86	5.62	7.11	8.14	7.28	5.64	5.50

Source: Construction in Azerbaijan, Statistical Year Book, SSC of Azerbaijan, 2018

Figure 7: Rank of Azerbaijan in the "Ease of Doing Business" indicators (190 countries), 2019



Source: World Bank, Ease of Doing Business, 2019

Another internationally recognised benchmarking indicator, the Global Competitiveness Report published by the World Economic Forum, ranked Azerbaijan as the 69th most competitive nation in the world out of 140 countries in its 2018 edition. This was a slight decline compared

15 Based on the average USD–AZN exchange rate from the World Bank and the Central Bank of Azerbaijan, 2019.

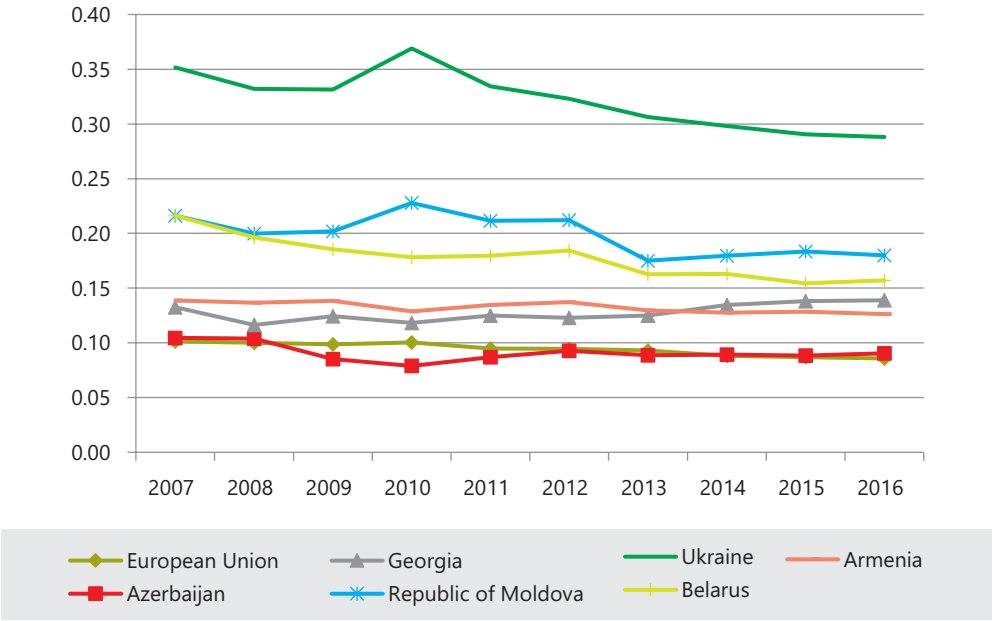
to its 2017 ranking, where Azerbaijan was positioned 65th out of 135.[16] On one hand, this can be explained by the updated methodology applied in the latest report as well as the drop in oil prices, which had a major impact on the country's macroeconomic environment.

According to "EU Business Climate Report Azerbaijan 2018 – perceptions of EU business active in Azerbaijan", compared to previous years, more EU companies appear to be committed to Azerbaijan in terms of investment decisions. More precisely, 66% of EU businesses participating in the survey stated that they would invest again in Azerbaijan, while only 10% said that they would reconsider their investments. A total of 53% of EU companies claimed to be planning to expand their business activities in the country over the next one to two years, substantially higher than in the previous year (33%). Moreover, 63% of those who said they would choose Azerbaijan again as an investment destination also intend to grow their business.[17]

Energy intensity

The energy intensity of Azerbaijan decreased by 14% or from 0.105 to 0.090 tonnes of oil equivalent (toe) per thousand 2011 USD PPP during 2007–2016 and followed almost the same dynamics as the energy intensity of the EU (Figure 8). This figure also illustrates that the country's energy intensity indicators were the lowest in the EaP region during the whole analysed period.

Figure 8: Energy intensity – TPES/GDP, 2007–2016, toe per thousand 2011 USD PPP

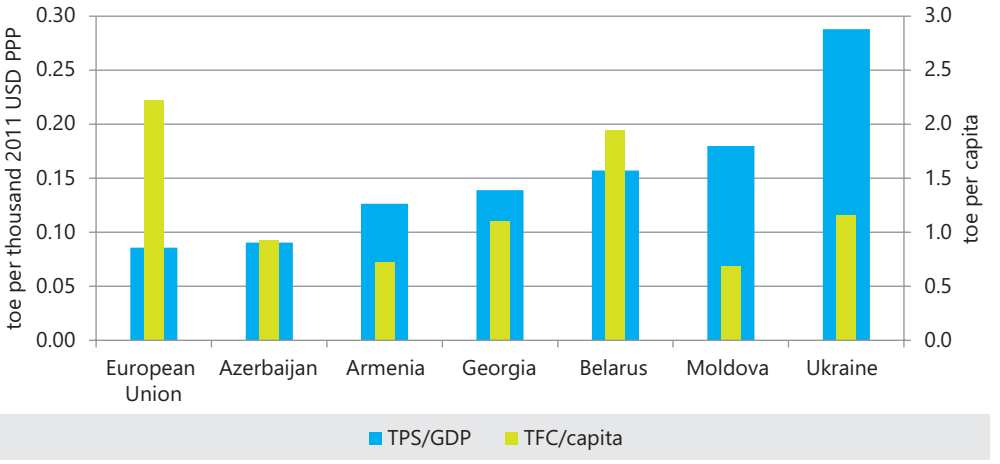


Source: World Bank, International Comparison Program database, 2019
Database of the International Energy Agency, 2019

16 http://reports.weforum.org/global-competitiveness-report-2018/country-economy-profiles/#economy=AZE (accessed June 2019).
17 https://eeas.europa.eu/sites/eeas/files/business_climate_report_-2018.pdf (accessed June 2019).

Taking into account that the analysis of energy intensity alone does not reflect the overall efficiency of the country without considering other indicators, Figure 9 also provides a comparison of energy consumption per capita. Thus, despite the fact that the energy intensity of Azerbaijan was almost at the same level as in the EU, the average consumption in the 28 EU countries in 2016 was 2.4 times higher than in Azerbaijan. At the same time, energy consumption per capita in Azerbaijan was higher by 28% than in Moldova, even though energy intensity in Azerbaijan was twice as low. This may also indicate that standards of living in Moldova are among the lowest in the region, whereas Azerbaijan's correlation between energy intensity and energy consumption per capita is the best in the EaP region.

Figure 9: Comparison of energy intensity and total final consumption (TFC) per capita in EaP countries and the EU in 2016



Source: World Bank, International Comparison Program database, 2019
Database of the International Energy Agency, 2019

Summary: Background

Azerbaijan is an energy-rich country that became a major regional energy player after restoring its independence in 1991. The country's territory covers an area of 86,600 sq. km and borders Russia, Georgia, Iran, Turkey and Armenia. Azerbaijan has a population of about 10 million, 53% of whom reside in urban areas. Due to its geographical position, the territory of Azerbaijan includes eight out of 11 existing world climate zones.

Azerbaijan is an upper-middle income country, with a GDP per capita at PPP, current international USD of 17,460, representing 43% of the EU28 average in 2017. Oil exports have constituted the main revenue source for the economic development of the country, rendering it vulnerable to external shocks and changes in global oil prices. The GoA has devoted significant efforts to develop its non-oil sector, leading to an increase in the non-oil share of its economy in GDP from 38% in 2008 to 57% in 2017.

As of 2017, one third of all GDP-generating activities are related to oil and natural gas extraction, yet this sector employs less than 1% of the employed population. At the same time, 37% of the working population are involved in agricultural sector, contributing 6% to the GDP. Transportation, distribution and storage of electricity, natural gas and heat energy contribute 1% to the GDP and employ 5% of the employed population. The unemployment rate was about 5% in 2017.

During 2008–2017, almost 90% of all energy investments were related to the extraction of hydrocarbons and 9% to the development of the electricity sector, including renewables. Investments in natural gas and heat distribution and supply sectors were insignificant compared with other energy subsectors. Azerbaijan is a CIS leader, ranked 25 among 190 economies in the 2019 Ease of Doing Business rating.

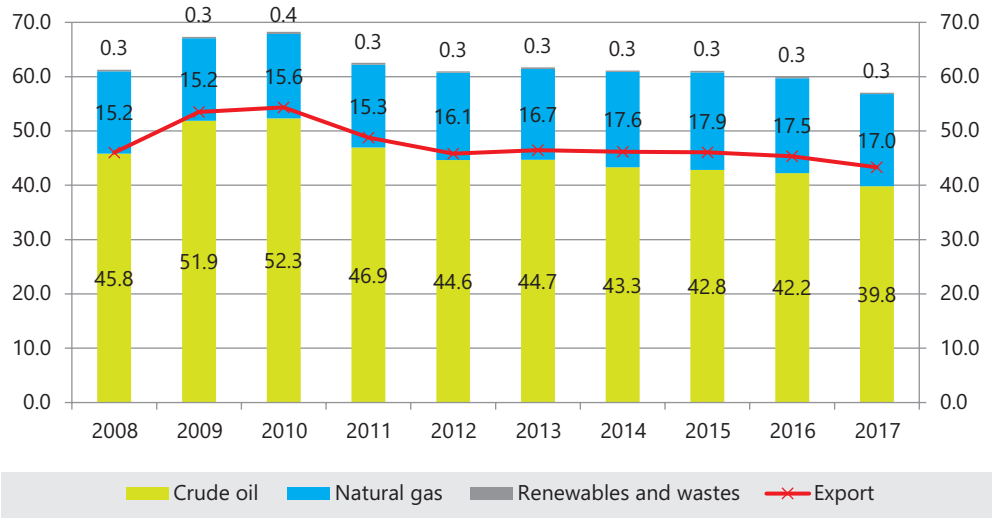
The energy intensity of Azerbaijan decreased by 14% or from 0.105 to 0.090 toe per thousand 2011 USD PPP during 2007–2016. It followed almost the same dynamics as the energy intensity of the EU. The country's energy intensity indicator is the lowest in the EaP region.

2. Energy Supply and Demand

2. Energy Supply and Demand

Azerbaijan is a large oil and gas producer and a net energy exporter. In 2017 the country was ranked 20th in the world for its proven oil reserves[18] and 27th for its natural gas reserves.[19] Oil production reached its peak in 2010 and has been decreasing since. Gas production had been growing during 2008–2015 and started a declining trend in 2016. In total, oil production decreased by 13.1% while natural gas production increased by 11%, resulting in a 6.9% decline in total primary energy production during 2008–2017. The highest level of production of 67.9 Mtoe was in 2009 and the lowest of 56.8 Mtoe was in 2017 (Figure 10).

Figure 10: Primary energy production and export, 2008–2017, Mtoe



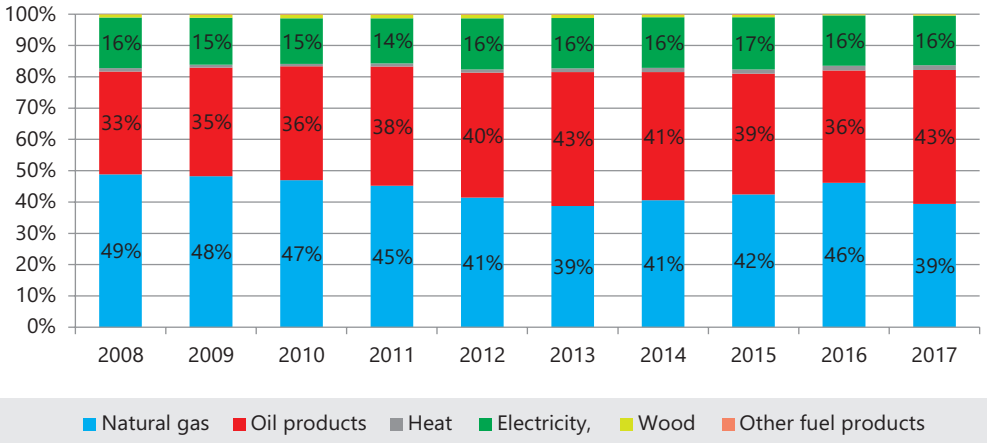
Source: State Statistics Committee, 2019

Figure 10 indicates that Azerbaijan exported on average 76.5% of all produced energy during 2008–2017. Crude oil is the largest exported commodity, in 2017 representing 78% of total exports, with natural gas 19.1%, diesel 1.4%, electricity 0.3% and other types of fuels 1.2%.[20]

Azerbaijan does not only export produced hydrocarbons, but uses them in a major way to cover the growing demand of its economy. Over the last decade, natural gas accounted for 39-49% and oil products for 33-43% of the country's total final consumption (Figure 11). Taking into account that there is no nuclear or coal-fired power generation in the country, natural gas remains the main source for the production of electricity and heat energy. In 2017, the share of renewable energy accounted for 1.66% of the total primary energy supply or 8.1% of the total electricity generation, mainly represented by hydropower plants.[21]

18 https://www.worldatlas.com/articles/the-world-s-largest-oil-reserves-by-country.html (accessed August 2019)
19 https://www.cia.gov/library/publications/the-world-factbook/rankorder/2253rank.html (accessed August 2019).
20 State Statistics Committee, Final energy consumption 2019, available at https://www.stat.gov.az/source/balance_fuel/?lang=en (accessed May 2019).
21 State Statistics Committee, Production of electricity, 2019, available at https://www.stat.gov.az/source/balance_fuel/?lang=en (accessed May 2019).

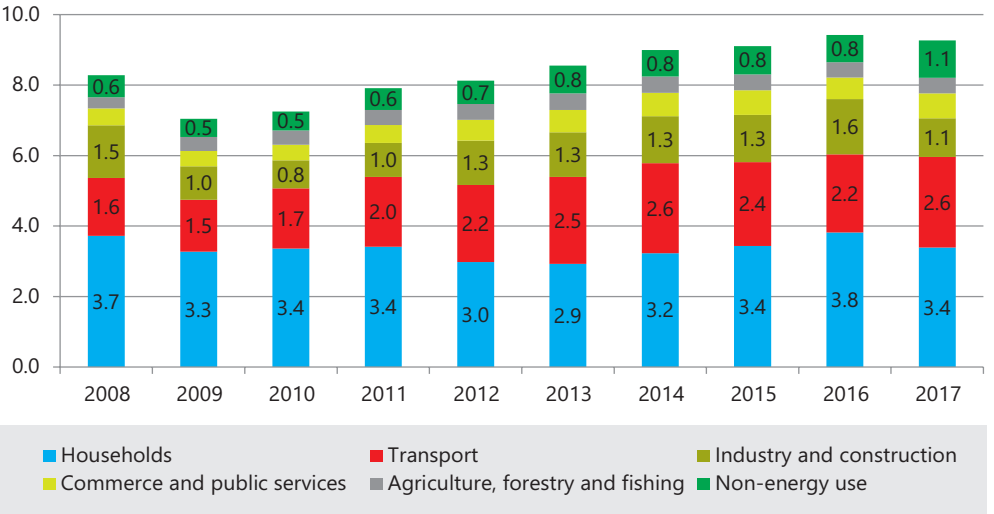
Figure 11: Total final consumption per fuel, 2008–2017, %



Source: State Statistics Committee, 2019

The total final consumption (TFC) of the country increased by 12% over the last decade (Figure 12). During 2008–2017 the highest growth of energy consumption was recorded in non-energy use and transport sectors and resulted in 68% and 56% increases, respectively. Consumption in services increased by 48% and in the agricultural sector by 42%. At the same time, energy consumption decreased by 27% in industry and by 9% in the household sector.

Figure 12: Total final consumption by sectors, 2008–2017, Mtoe



Source: State Statistics Committee, 2019

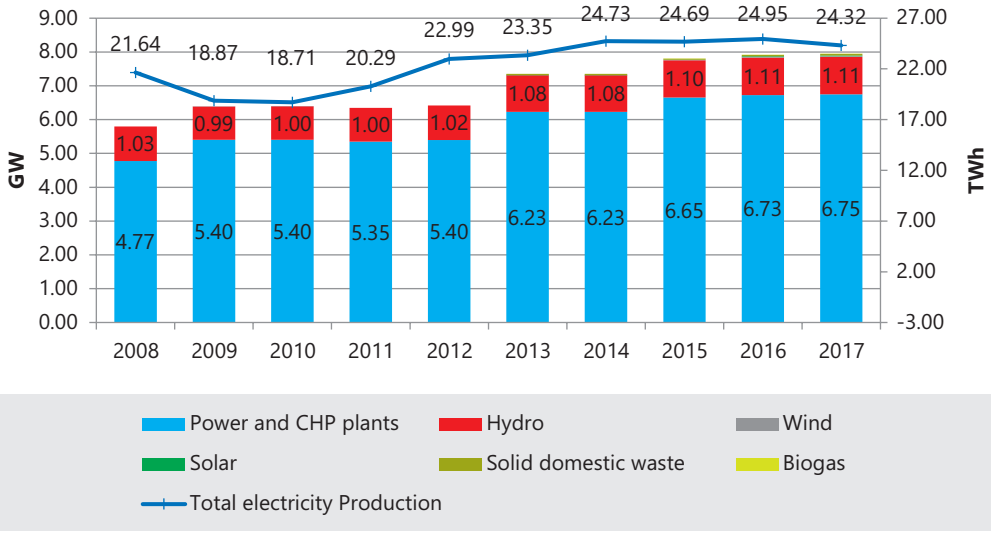
A closer analysis of TFC illustrates a significant decrease in consumption in 2009 in all sectors of the economy as a result of the financial crisis and the steady growth that followed the economic recovery during 2009–2016. In 2017, TFC decreased by 2% compared with the previous year, standing at 9.3Mtoe. The residential and transport sectors were the dominant energy consumers in the last decade: in 2017 their TFC shares were 37% and 28%, respectively.

2.1. Electricity

Natural gas is the main source of electricity generation in Azerbaijan. The total installed capacity of thermal power and combined heat and power (CHP) plants increased by 41% and hydro plants by 8%, which along with a minor RES development resulted in an increase of total installed capacity by 37% during 2008–2017 (Figure 13). As of the end of 2017, the total installed capacity of the country was 7,941.5 MW,[22] including the following:

- Electric and CHP plants - 6,748.0 MW (+1,975 MW during 2008–2017);
- Hydro - 1,106.4 MW (+81.4 MW during 2008–2017);
- Wind - 15.7 MW (installed during 2009–2017);
- Solar - 28.4 MW (installed during 2013–2017);
- Solid domestic waste - 42.0 MW (installed during 2013–2017);
- Biogas - 1.0 MW (installed in 2015).

Figure 13: Total installed capacity (GW) and electricity production (TWh), 2008–2017



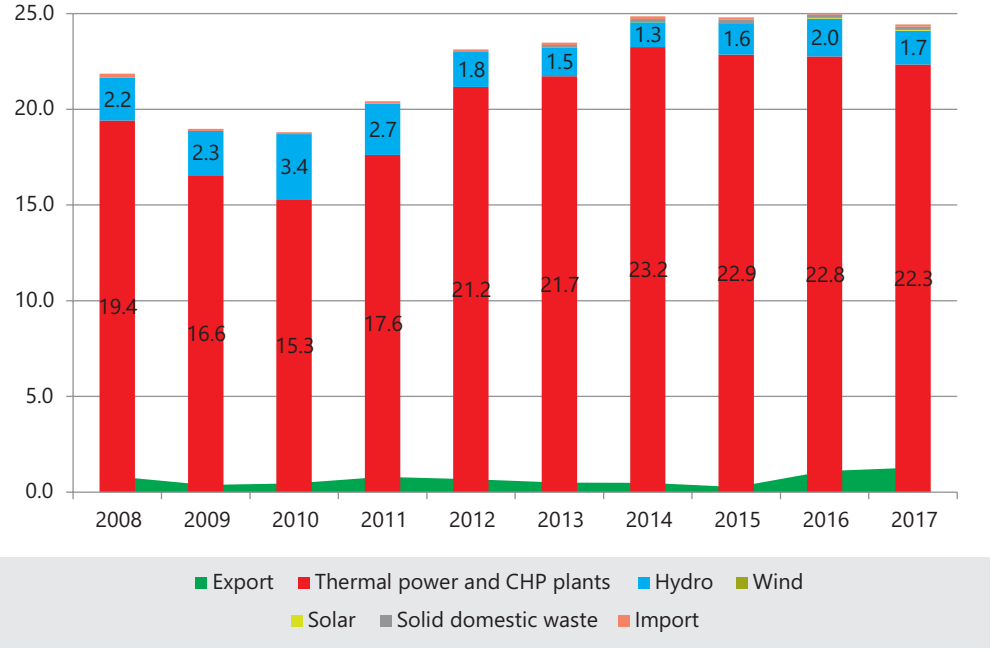
Source: State Statistics Committee, 2019

Figure 13 also indicates that the installation of new capacities did not coincide with the dynamics of electricity production over the last decade. In total, electricity generation increased by 12% compared with a 37% increase in installed capacity over the same period. A closer analysis of electricity production reveals only a 15% increase in electricity production

22 https://www.stat.gov.az/source/balance_fuel/?lang=en (accessed August 2019).

by thermal power and CHP plants (Figure 14). At the same time, electricity production by hydro decreased by 22%. Electricity exports varied from 2% of total generation in 2009 to 5.3% in 2017. Electricity imports dropped from 1% in 2008 to 0.5% in 2009 and fluctuated at the level of 0.5-0.7% during 2009–2017.

Figure 14: Electricity production, import and export, 2008–2017, TWh

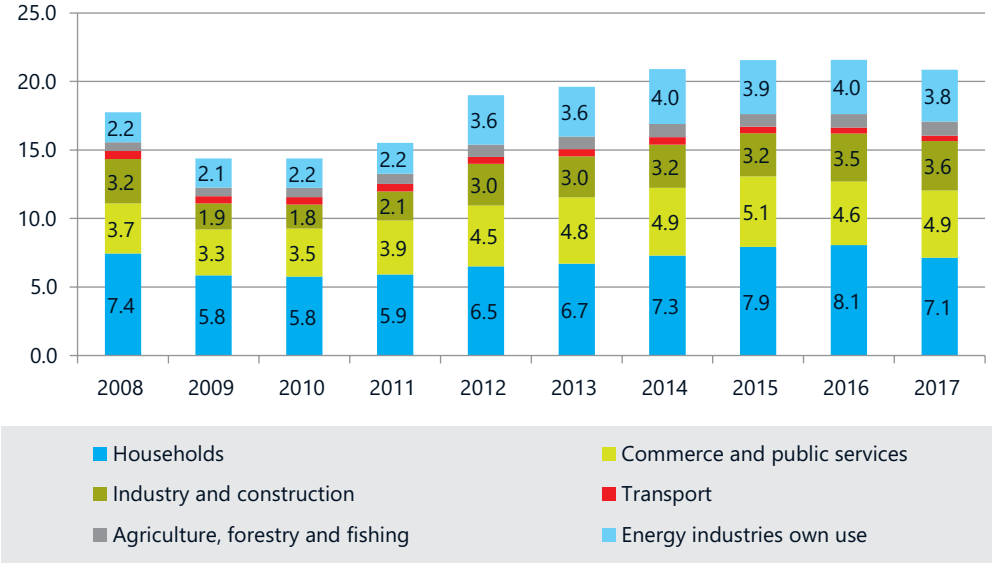


Source: State Statistics Committee, 2019

Changes in electricity production were also related to the fluctuation in electricity demand on the domestic market. Figure 15 shows that the total electricity demand of Azerbaijan increased by 17.5% from 2008 to 2017. At the same time, significant changes occurred in the electricity consumption of three major sectors over the last decade:

- The household sector's consumption decreased by 21% in 2009, slowly increased by 40% during 2010–2016 and then decreased again by 12% in 2017. In total, the sector's consumption fell by 4.2% during 2008–2017;
- Consumption by commerce and the public sector grew from 2% to 13% throughout the analysed period, except in 2009 and 2016 when it decreased by 8% and 10%, respectively. In total, consumption by services increased by 34.3% during 2008–2017;
- Consumption by the industry and construction sector decreased by almost 50% in 2009–2010, but again increased by 63% during 2011–2012 and fluctuated from -1% to +13% during 2013–2017. In total, the sector's electricity consumption increased by 11.3%;
- Energy industries' own use gradually increased by 80% during 2008–2016 and decreased by 4.6% in 2017.

Figure 15: Electricity consumption by sectors, 2008–2017, TWh



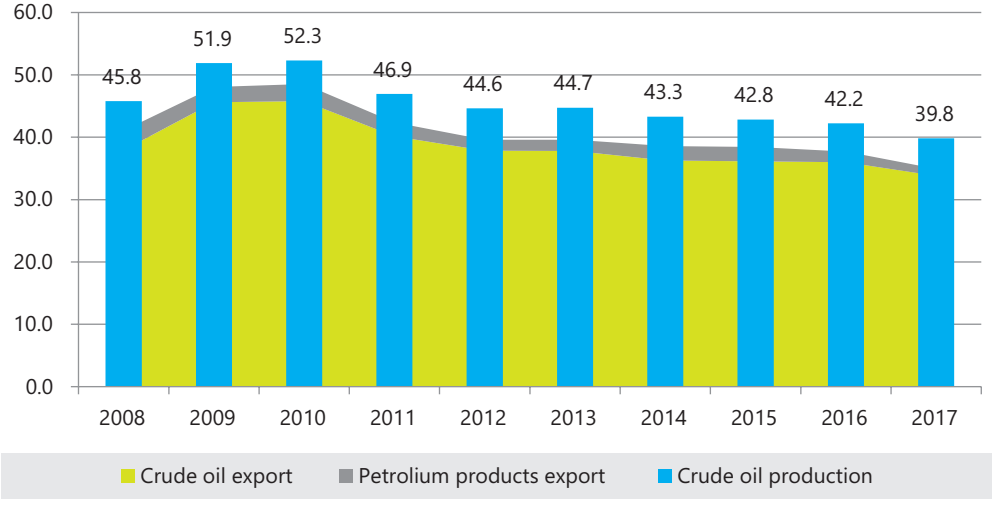
Source: State Statistics Committee, 2019

2.2. Coal

There are neither coal production nor coal consumption facilities in Azerbaijan.

2.3.Oil Products

Figure 16: Crude oil production and oil products export, 2008–2017, Mtoe



Source: State Statistics Committee, 2019

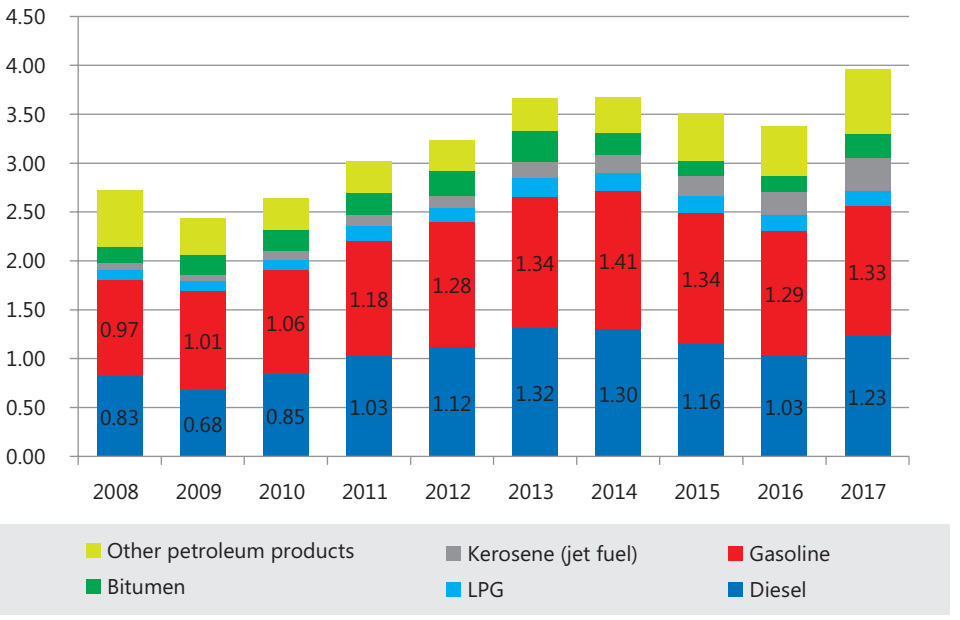
In 2017, Azerbaijan was ranked 20th in the world for its proven oil reserves[23] and 23rd for its oil production.[24] Oil production reached its peak in 2010 and has been decreasing since then (Figure 16).

In total, the oil production decreased by 13.1% during 2008–2017. The export of oil products varied from 88% of total crude oil production in 2017 to 93% in 2009–2010. The share of import of oil products, though insignificant, decreased from 0.16% to 0.06% during 2008–2012 and gradually increased to 1% in 2017. In 2017, Azerbaijan also started importing crude oil, but the share of import was only 0.16% of total oil production. The reduction in oil production and increased demand on the domestic market also resulted in the reduction of export of crude oil and petroleum products by 11% and 64%, respectively.

Despite the sharp reduction in 2009, 2015 and 2016, the consumption of oil products on the domestic market increased by 45% over the last decade, including the growing consumption of the following fuels (Figure 17):

- Diesel – 48.4% or 0.40 Mtoe;
- Gasoline – 37.0% or 0.36 Mtoe;
- Kerosene (jet fuel) – 401.2% or 0.27 Mtoe;
- Other petroleum products – 16.5% or 0.09 Mtoe;
- Bitumen – 40.6% or 0.07 Mtoe;
- LPG – 35.8% or 0.04 Mtoe.

Figure 17: Consumption of oil products, 2008–2017, Mtoe



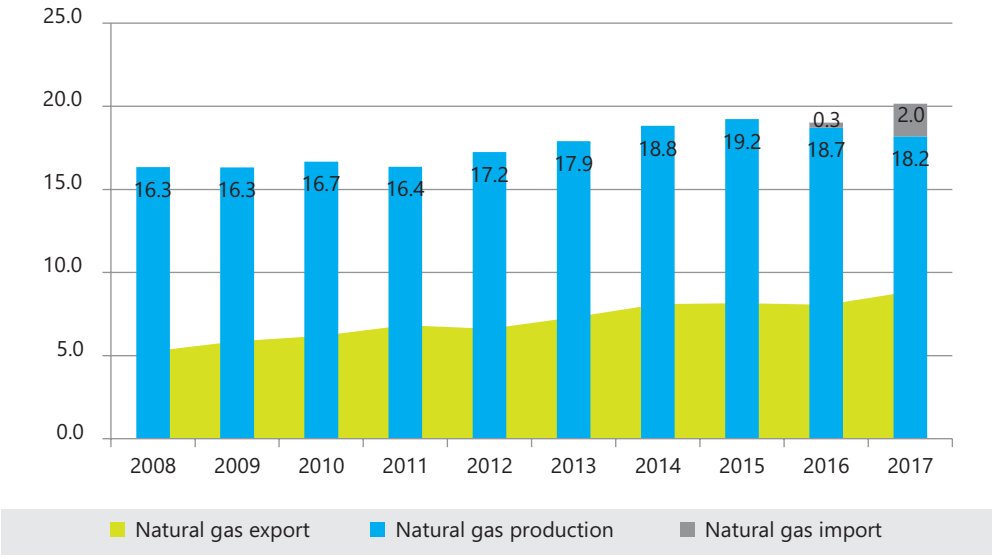
Source: State Statistics Committee, 2019

23 https://www.worldatlas.com/articles/the-world-s-largest-oil-reserves-by-country.html (accessed August 2019).
24 https://www.eia.gov/beta/international/data/browser/#/?pa=0000000000000000000000000000000002&c=ruvvvvvfvtvnvv1vrvvvvfvvvvvfvvvou20evvvvvvvvvvvvuvo&ct=0&tl_id=5-A&vs=INTL.57-1-AFG-TBPD.A&vo=0&v=H&end=2018 (accessed August 2019).

2.4. Natural Gas

In 2017 the country was ranked 27th for its natural gas reserves[25] and 32nd for its natural gas production.[26] Natural gas production reached its peak in 2015 and has been decreasing since then (Figure 18). Although Azerbaijan has historically been an oil producer, its significance in the region is growing as a gas producer and exporter.

Figure 18: Natural gas production, import and export, 2008–2017, bcm



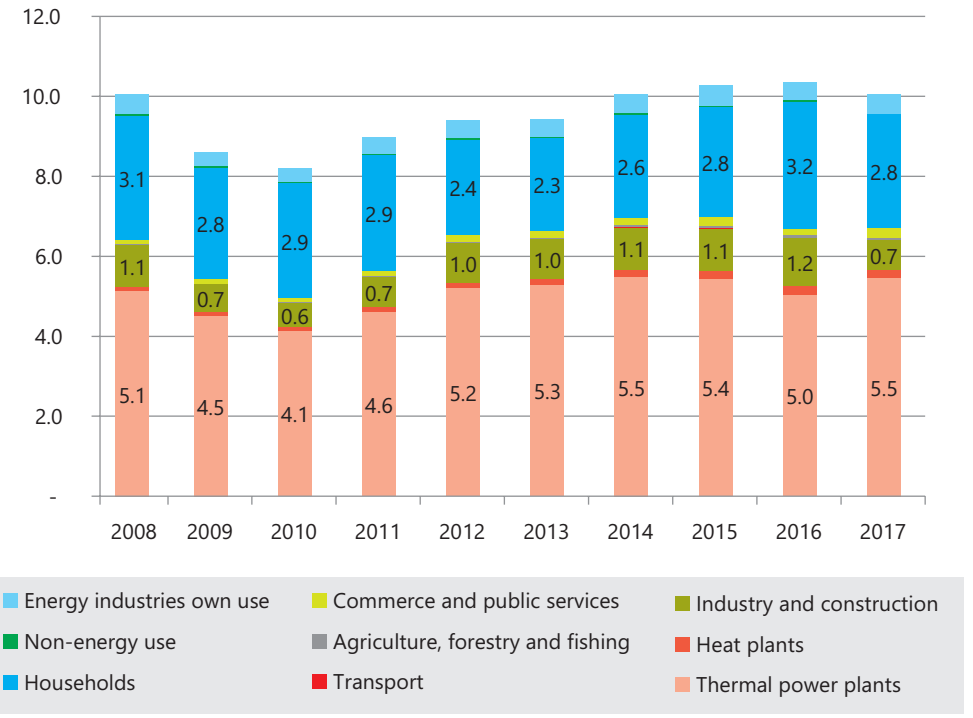
Source: State Statistics Committee, 2019

In total, natural gas production increased by 11.7% and the export of natural gas increased by 68.9% during 2008–2017. This resulted in an increase in gas export from 32.2% of total production in 2008 to 48.7% in 2017. At the same time, 2016 was the first year when the country started importing natural gas and the volume of import increased from 1.6% of gas production in 2016 to 11.6% in 2017 in order to cover the imbalance of demand and supply.

Despite the fluctuation from -14% in 2009 to +9% in 2011, natural gas consumption in 2017 remained almost the same as in 2008 (Figure 19). However, there were some noteworthy changes in the structure of natural gas consumption over the last decade. Consumption by households decreased by 8%, whereas the demand of services and agricultural sectors increased two- and threefold, respectively. Consumption by thermal power plants increased by 7% and by heat plants by more than twofold.

25 https://www.cia.gov/library/publications/the-world-factbook/rankorder/2253rank.html (accessed August 2019).
26 https://yearbook.enerdata.net/natural-gas/world-natural-gas-production-statistics.html (accessed August 2019).

Figure 19: Consumption of natural gas, 2008–2017, bcm



Source: State Statistics Committee, 2019

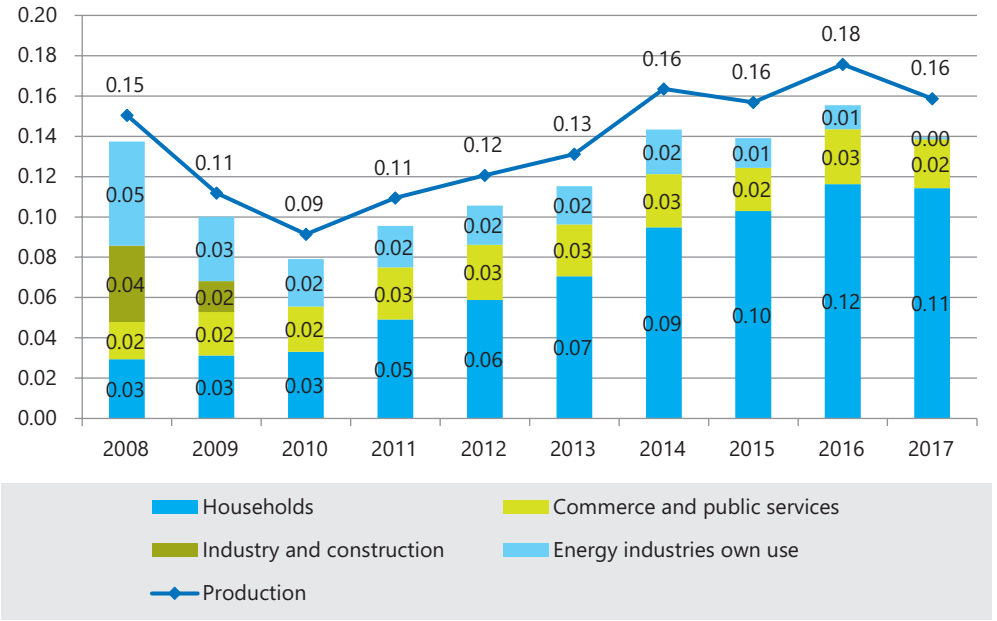
2.5. Heat

The main source for the production of heat energy in Azerbaijan is natural gas. There were significant fluctuations in heat energy production over the last decade, but in 2017 the level of production of heat energy was only 5.5% higher than in 2008 (Figure 19). At the same time, heat consumption grew by 2% over the same period, indicating a reduction in heat losses during 2008–2017.

As for consumption by sectors, there were significant changes in the consumption pattern (Figure 20):

- Industry and construction sectors accounted for 28% of heat demand in 2008, but stopped consuming heat energy in 2009 mainly because of the installation of their own heating faculties;
- Energy industries' own use accounted for 38% of heat demand in 2008, but gradually reduced consumption to almost zero in 2017;
- Energy consumption by commercial and public services fluctuated at the level of 0.02-0.03Mtoe;
- Consumption by the household sector increased almost fourfold during 2008–2017 as a result of targeted work on the reconstruction of non-operational district heating networks.

Figure 20: Production and consumption of heat energy, 2008–2017, Mtoe



Source: State Statistics Committee, 2019

Summary: Energy Supply and Demand

Azerbaijan is a large oil and gas producer and a net energy exporter. Indeed, the country exported an average 77% of all produced energy during 2008–2017. Crude oil has constituted the largest exported commodity, in 2017 representing 78% of total exports, with natural gas representing 19% and other types of energy carriers 3%. Azerbaijan also uses produced hydrocarbons to cover an internal energy demand that increased by 12% during 2008–2017. The residential and transport sectors have been the dominant energy consumers in the last decade. In 2017, the share of renewable energy accounted for 1.66% of the total primary energy supply and was mainly represented by hydropower plants.

There are neither nuclear nor coal facilities in Azerbaijan, with natural gas the primary source for electricity generation. During 2008–2017, the total installed generating capacity of the country increased by 37% and was about 8 GW at the end of the analysed period. At the same time, electricity generation increased by only 12% over the same period. As of 2017, gas-powered and hydro plants represented 85% and 14% of the total installed capacities and generated 92% and 7% of the total electricity produced, respectively.

In 2017, Azerbaijan was ranked 20th in the world for its proven oil reserves and 23rd for its oil production. Oil production reached its peak in 2010 and has been decreasing since then. The consumption of oil products on the domestic market increased by 45% over the last decade. Both factors resulted in the steady reduction of crude oil and petroleum products export during 2011–2017.

In 2017, the country was ranked 27th for its natural gas reserves and 32nd for its natural gas production. Although Azerbaijan has historically been an oil producer, its significance in the region is growing as a gas producer and exporter. The export of natural gas increased from 32.2% of total production in 2008 to 48.7% in 2017. To cover the recent imbalance of demand and supply on external markets, Azerbaijan started importing natural gas and the volume of import has increased from 1.6% of gas production in 2016 to 11.6% in 2017. Despite some structural changes, the total consumption of natural gas on the internal market in 2017 remained almost at the same level as in 2008.

The primary source for the production of heat energy in Azerbaijan is natural gas. There have been significant fluctuations in heat energy production and consumption over the last decade, but the level of production of heat energy in 2017 was only 6% higher than in 2008.

3. Market Structure for Electricity, Natural Gas and Heat

3. Market Structure for Electricity, Natural Gas and Heat

3.1. Electricity

As of September 2019, Azerbaijan's electricity market includes two state-owned companies operating in the mainland of the country and the State Energy Service of the Nakhchivan Autonomous Republic (AR) operating in the landlocked exclave of the Republic of Azerbaijan (see Figure 1). The activities are organised as follows:

- Azerenerji OJSC, responsible for generation and transmission for the whole country, except Nakhchivan AR;
- Azerishig OJSC, responsible for distribution and supply for the whole country, except Nakhchivan AR;
- State Energy Service, responsible for generation, transmission, distribution and supply in Nakhchivan AR.

Before February 2015, Azerenerji was a vertically integrated and 100% state-owned enterprise in charge of electricity generation, transmission, distribution and supply for the whole country, except Baku (the capital) and Nakhchivan Autonomous Republic. Before the reforms, electricity distribution and supply in Baku was organised by Bakielektrikshebeke OJSC. In February 2015, the government transferred all power distribution assets and functions from Azerenerji to Azerishiq (formerly Bakielektrikshebeke OJSC).

Despite the state-owned character of the power industry today, there are also a number of thermal power plants owned by industrial companies (mainly oil companies like British Petroleum (BP) and the State Oil Company of Azerbaijan Republic (SOCAR), operating as auto-producers) as well as RES plants owned by private owners and Azeralternative LLC. As of January 2019, the Azeralternative LLC was part of the State Agency for Alternative and Renewable Energy Sources (SAARES), established in 2009 to promote RES development in the country. However, it was abolished in January 2019 by the Presidential Decree (see Section 5.4). Not wholesale electricity market has yet been established.

Electricity generation

In May 2019, 57 plants with a total installed capacity of 7,146.6 MW operated in Azerbaijan.[27] More detailed information about the power plants, their capacity and the year of commissioning is provided in Annex 1, while Table 2 provides a summary of the ownership and type of electricity generation in the country. It should also be mentioned that the difference between the latest information available at the State Statistics Committee (see Section 2.1) and the information provided by Azerenerji[28] is related to the changes that occurred during the period January 2018–May 2019, namely:

- Decommissioning of Shrivan Thermal Power Plant (TPP), -900 MW;
- Modernisation of Mingachevir HPP, +424 MW;
- Commissioning of new RES capacities.

27 http://www.azerenerji.gov.az/index/page/13 (accessed April 2019).
28 Ibid.

Table 2: Installed power generation capacity, as of May 2019

		Thermal	CHP	Large hydro	Small hydro	Wind	Solar	Waste	Biogas	Total
Azerenerji	No	11	1	7	6	-	-	-	-	25
	MW	4,890.5	107.0	1,047.0	8.8	-	-	-	-	6,053.3
Nakhichevan	No	2	-	3	2	-	1	-	-	8
	MW	151.0	-	62.5	6.4		24.0	-	-	243.9
Azerishig	No	-	-	-	-	3	-	-	-	3
	MW	-	-	-	-	55.3	-	-	-	55.3
SAARES	No	-	-	-	-	1*	7*	-	1*	9
	MW	-	-	-	-	2.7	13.1	-	1.0	16.8
Other state-owned companies	No	1	-	-	1**	1	1	1	-	5
	MW	133.7	-	-	1.9	0.0	0.0	37.0	-	172.6
Private companies	No	3	-	-	3	1	-	-	-	7
	MW	588.7	-	-	7.9	8.0	-	-	-	604.6
Total	**No**	**17**	**1**	**10**	**12**	**6**	**9**	**1**	**1**	**57**
	MW	**5,763.9**	**107.0**	**1,109.5**	**25.0**	**66.0**	**37.2**	**37.0**	**1.0**	**7,146.6**
	%	**80.7%**	**1.5%**	**15.5%**	**0.3%**	**0.9%**	**0.5%**	**0.5%**	**0.0%**	**100.0%**

** Including Gobustan hybrid plant that combines wind, solar and biogas facilities*

*** Sheki small hydro power plant (SHPP) with installed capacity of 1.88MW (where one turbine 0.58MW belongs to SAARES)*

Source: Energy Charter Secretariat based on Azerenerji, 2019 & Ministry of Energy 2019

A closer analysis of Table 2 and Annex 1 indicates that Azerenerji is the largest electricity producer, controlling 85% of all generating capacities in the country. In total, 50 out of 57 plants or 91.5% of all installed capacity belongs to state-owned companies. Natural gas is the main source for 82% of generating capacities, including all TPPs and the only CHP plant, which operates in Baku. Large hydro plants represent 15.5% and RES sources 1.8% of installed capacity.

According to the information provided by the Ministry of Energy (MoEn), as of May 2019 there were also a number of ongoing projects at different stages of development, including the following:

- Shimal 2 TPP, 409 MW, Azerenerji – construction is completed, connected to the network and put into operation in 2019;
- Sumgait SPP, 2.17 MW, SAARES – construction is completed, expected to be connected to the network by the end of 2019;
- Three large HPPs, Nakhichevan AR – under construction:
  - Khudaferin HPP, 200 MW (joint project with the Islamic Republic of Iran, 100 MW for each party);

- Giz Galasi HPP, 80 MW (joint project with the Islamic Republic of Iran, 40 MW for each party);
- Ordubad HPP, 36 MW;

• Four small HPPs, Azerenerji, 3.9 MW – under construction.

Apart from the above ongoing projects, the MoEn has also identified five potential land plots for the construction of solar and wind plants (100-200 MW each) and plans to start implementing RES auctions in mid-2020. Seven big companies, including BP and Shell have already signed memorandums of understanding (MoUs) with the Ministry of Energy on cooperation in the RES field.[29]

Electricity transmission

Azerenerji's high-voltage transmission network includes 110, 220, 330 and 500 kV voltage substations and transmission lines. It has connections with the energy systems of Russia (330 kV), Georgia (500-330330 kV), Iran (220-330330 kV) and Turkey (154-132330 kV). The total length of the high-voltage transmission lines is over 7,600 km.[30] The operation of Azerbaijan's power system is managed by the Central Dispatching Department (CDD), which uses Supervisory Control and Data Acquisition (SCADA) to manage, control and optimise the system in real time.

Azerenerji JSC is the main exporter of electric energy in Azerbaijan. In 2017, Azerbaijan produced 24.3 TWh of electricity, 5.3% or 1.3TWh of which (See Section 2.1.) was exported to Georgia (0.92 TWh), Turkey (0.2 TWh), Russia (0.1 TWh) and Iran (0.04 TWh) via the existing high voltage lines with these countries. Azerbaijan intends to significantly increase its electricity exports in the coming years. The launch of the 500 kV Samukh-Gardabani air transmission line in 2013 made it technically feasible to export electricity from Azerbaijan to Georgia and Turkey and in the future to the Black Sea and Eastern European countries.

In December 2018, Azerbaijan and Georgia signed a memorandum on the prospects of Azerbaijani-Georgian power systems and discussed the possible construction of a 330 kV two-way transmission line between the two countries. On the other hand, the second power transmission line of 230 kV "Masalli" is under construction between the power systems of Azerbaijan and Iran. Negotiations over developing the second 330 kV "Absheron-Derbent" air transmission line with Russia as well as the establishment of the Russia-Azerbaijan-Iran electricity corridor are underway.[31]

Electricity distribution and supply

In Azerbaijan, the distribution system is considered a network at a voltage level below 110 kV. However, there is no strict division regarding the voltage level and in some cases both a TSO and a distribution system operator (DSO) own the 110 kV voltage level.

Azerishiq JSC is responsible for the distribution network and power supply of the entirety of Azerbaijan, except the Nakhchivan AR. Azerishiq includes the following eight regional energy supply and sales departments (RESSDs): Baku, Western, Southern, Shirvan, Northern, North-Western, Aran and Central Aran. The total installed capacity of the substations operated by Azerishig exceeds 10,000 MVA.

29 According to information provided during a meeting with the Ministry of Energy on 14 May 2019.
30 http://www.azerenerji.gov.az/index/page/14 (accessed August 2019).
31 http://www.minenergy.gov.az/index.php/en/news-archive/159-19-10-18 (extract from the Minister of Energy Parviz Shahbazov's article published in Azerbaijan newspaper dated 19 October 2018).

3.2. Natural Gas

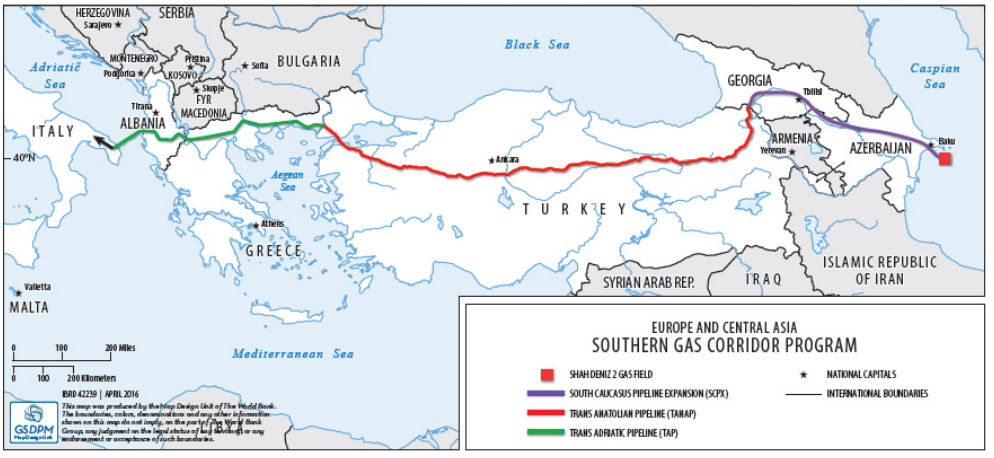
SOCAR is the state-owned monopoly involved in exploring oil and gas fields, producing, processing and transporting oil, gas and gas condensate, marketing petroleum and petrochemical products in domestic and international markets and supplying natural gas to industry and the public in the country. SOCAR comprises the following corporate entities: three production divisions, an oil refinery, a gas processing plant, a deep-water platform fabrication yard, two trusts, one institution and 23 subdivisions. SOCAR owns businesses in Georgia, Turkey, Romania, Switzerland, Germany and Ukraine, including trading activities, mainly in Switzerland, Singapore and Nigeria.[32]

Natural gas upstream

The natural gas upstream sector in Azerbaijan is mainly concentrated in the Shah Deniz field. It is one of the world's largest gas and condensate fields, located on the deep-water shelf of the Caspian Sea and accounts for the majority of Azerbaijan's natural gas reserves. The Shah Deniz field is operated by an international consortia including Turkish Petroleum Corporation (TPAO), SOCAR, Petronas, Lukoil and NIOC and is led by BP as a major shareholder. Shah Deniz Stage 1 became operational in 2006 with a gas production capacity of around 10 billion cubic metres of gas per annum (bcma).[33]

Shah Deniz Stage 2, or Full Field Development (FFD), is a large project that will add another 16 bcma of gas production. Shah Deniz Stage 2 can potentially help increase European energy security by bringing Caspian gas resources to EU markets. The project can potentially deliver 6 bcma of gas to Turkey and a further 10 bcma of gas to markets in Europe, via the Southern Caucasus, Trans-Anatolian (TANAP) and Trans Adriatic (TAP) pipelines in a route known as the Southern Gas Corridor (Figure 21).[34]

Figure 21: Southern Gas Corridor



Source: World Bank, 2016

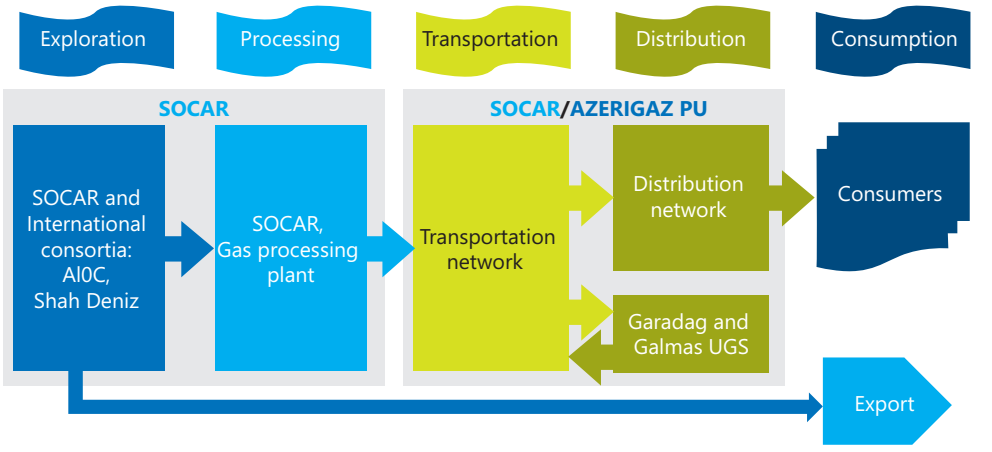
32 http://www.socar.az/socar/en/company/about-socar/discover-socar (accessed August 2019).
33 https://www.bp.com/en_az/caspian/operationsprojects/Shahdeniz/SDstage1.html (accessed July 2019).
34 https://www.bp.com/en_az/caspian/operationsprojects/Shahdeniz/SDstage2.html (accessed July 2019).

Natural gas transmission, distribution and supply

Until 2009, "Azerigaz" OJSC was a separate state-owned company, responsible for the transmission, distribution and supply of natural gas. In July 2019, according to the Presidential Decree "On Improvement of Management Mechanisms in Oil and Gas Industry",[35] the Azerigaz OJSC was reorganised and placed under the control of SOCAR. As part of the reorganisation process, the company was also renamed Azerigaz Production Unit (PU).

As of September 2019, Azerigaz PU is responsible for the transmission, storage, distribution and supply of natural gas, whereas SOCAR is responsible for natural gas exports (see Figure 22). The total volume of gas transported annually including internal consumption and export is 12.6 bcma.[36] Azerigaz PU operates two underground storage facilities, namely Galmaz and Garadag, with a total design storage capacity of about 3.5 and 2 bcm, respectively.

Figure 22: Simplified scheme of the natural gas market in Azerbaijan



Source: INOGATE, 2016[37]

According to the 2016 Strategic Road Map on the Development of Public Utilities,[38] Azerigaz PU carried out significant investments in network rehabilitation and enlargement, resulting in the connection of more than 1,300 settlements to natural gas from 2009 to 2016.[39] As of January 2018, there were about 2.1 million consumers of natural gas[40] and in March 2019, the total gasification rate reached 95.7%.[41]

The existing legislative framework does not envisage the unbundling of SOCAR or the opening of internal gas market.

35 Presidential Decree No. 366. Dated 1 July 2009.
36 http://www.socar.az/socar/en/company/organization/azerigas-production-union (accessed April 2019).
37 "Preparation of a Concept Note and a Road Map for the Setup of an Independent Energy Regulator, towards the Development of the Country's Energy Market", CWP01.AZ, INOGATE, 2016.
38 Approved by the Presidential Decree No. 1138, dated 6 December 2016.
39 2016 Strategic Road Map on the Development of Public Utilities, p.15.
40 Ministry of Energy's 2017 progress report on implementation of "Azerbaijan 2020: Look into the Future" Development Concept, p.4, available at http://www.minenergy.gov.az/index.php/az/proqramlar?id=21.
41 https://news.day.az/azerinews/1106371.html (accessed August 2019).

3.3. Heat

District heating

The functions of production, distribution and supply of heat energy are assigned to Azeristiliktechizat OJSC. This company was established in June 2005 by a Presidential Decree "On Improvement of Management in the Field of Heat Supply in the Republic of Azerbaijan"[42] and currently operates in 51 of 63 of the administrative regions of Azerbaijan.

As of 2017, Azeristiliktechizat OJSC owns 545 boiler-houses and supplies heat to 3,700 residential consumers and 1,360 social and other facilities (Table 3), the majority of which are located in Baku city.[43]

Table 3: Number of consumers of district heating system in Azerbaijan in 2008–2017

Indicators	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of boilers	312	310	329	347	362	425	508	525	531	545
Number of buildings	1,933	2,072	2,184	2,357	2,561	2,819	3,142	3,450	3,568	3,700
Schools	277	242	244	260	266	267	275	286	276	275
Pre-schools	123	141	153	163	158	146	156	160	154	155
Healthcare facilities	127	126	133	135	129	134	147	157	151	150
Other objects	203	225	265	306	310	350	428	553	603	780

Source: Azeristiliktechizat, 2019

Table 3 also shows that Azeristiliktechizat has significantly increased the number of connected residential consumers (+91%) and other facilities (+284%), accordingly resulting in an increased number of boilers (+75%). Despite the increase in the number of connected residential consumers, only 2.6% of residential buildings in Azerbaijan enjoyed access to district heating services in 2017. At the same time, some newly built multi-apartment houses have their own boiler-houses that do not belong to Azeristiliktechizat and are therefore not reflected in Table 3. Furthermore, Figure 20 above shows that the company has significantly increased output to residential consumers, but industrial consumption decreased almost to zero during 2008–2017 (see Chapter 2.5 for more details).

42 Presidential Decree, dated 8 June 2005.
43 http://azeristilik.gov.az/index.php?page=sp&n=14 (accessed July 2019).

Summary: Market Structure for Electricity, Natural Gas and Heat

Since the reforms of 2015, the electricity market of Azerbaijan comprises two state-owned natural monopolists as well as state-owned and private generators that operate in the mainland of the country. Azerenerji OJSC is the TSO and the largest electricity producer, owning 85% of all generating capacities. Electricity distribution and supply functions in Azerbaijan's mainland are assigned to Azerishig OJSC. Electricity generation, transmission, distribution and supply in the landlocked exclave of the country are executed by the State Energy Service of Nakhchivan AR. In total, 50 out of 57 plants or 91.5% of all installed capacity belongs to state-owned companies. Natural gas is the primary source for 82% of generating capacities. Meanwhile, large hydro represents 15.5% and RES sources 1.8% of the total installed capacity.

The SOCAR is the state-owned monopoly that is among other activities involved in the exploration, extraction, transmission, distribution and supply of natural gas. The natural gas upstream sector in Azerbaijan is mainly concentrated in the Shah Deniz field located in the deep-water shelf of the Caspian Sea. The continued development of this field can potentially bring six bcma of gas to Turkey and ten bcma of gas to the EU via TANAP and TAP pipeline projects.

The functions of production, distribution and supply of heat energy are assigned to Azeristiliktechizat OJSC. The company was established in June 2005 and currently operates in 51 of 63 of the administrative regions of Azerbaijan. Despite the recent increase in the number of connected residential consumers, less than 3% of residential buildings in Azerbaijan have access to district heating services.

4. Energy Pricing Policy

4. Energy Pricing Policy

Energy tariffs in Azerbaijan are regulated by the Tariff Council, an inter-ministerial collegial body established in 2005 according to Presidential decrees "On Strengthening of Anti-inflation Measures in Azerbaijan Republic"[44] and "On Approval of the Statute of the Tariff (Price) Council of the Republic of Azerbaijan".[45] The Council is chaired by the Minister of Economy and includes representatives from relevant ministries and other state authorities, including the Ministry of Energy. In January 2019, the Secretariat of Tariff (Price) Council was abolished and no longer receives funding from the state budget. As of September 2019, the Council remains functional based on the voluntary representation of all involved ministries and state authorities.

In the energy sector, the Tariff Council determines the retail and wholesale tariffs (prices) for electricity, gas, central heating services and refined petroleum products as well as purchased tariffs for RES and de facto feed-in tariffs (FIT). However, in November 2016 the hot water tariffs were removed from the list of state-regulated tariffs (prices) with the aim of continuing measures to liberalise state-regulated tariffs (prices) in the country.[46]

Energy tariffs, along with other regulated prices, are approved according to the Decree of the Cabinet of Ministers "On Approval of Rules Ensuring State Control over Formation and Application of State Regulated Tariffs (Prices)".[47] These rules stipulate alternative methodologies for calculating prices provided that the regulated prices positively affect the socioeconomic development of the country, but de facto all energy-related tariffs are determined based on a "cost plus" methodology. As of September 2019, there is no separate methodology for the calculation of electricity, natural gas and heat tariffs. The draft Methodology of Electricity Tariff Calculation is currently under preparation in the framework of the ADB TA project "Azerbaijan: Preparation of the Power Sector Financial Recovery Plan". The draft methodology is based on the regulatory asset base model.

In December 2017, the new Azerbaijan Energy Regulatory Agency (AERA) was created.[48] The AERA was established on the basis of the State Energy and Gas Supervision departments of the Ministry of Energy (see more details in Section 5.4) and operates under the subordination of the Ministry of Energy. The Agency analyses public utilities' proposals for electricity, natural gas and heat tariffs and submits relevant proposals to the Tariff Council. As of September 2019, the activities of the AERA are supported by an EBRD-funded project "Support for the Functioning of the Newly Established Energy Regulatory Agency in the Republic of Azerbaijan–Phase I". The technical assistance (TA) project provides capacity building to the Agency and supports the development of a legislative framework necessary for functioning as an independent energy regulator in line with the third EU legislative package.

After the approval of the draft Law on the Regulator, developed within this TA, all functions related to the calculation and approval of energy tariffs will be transferred from the Tariff Council to AERA. The draft law was submitted to the Cabinet of Ministries for inter-ministerial consultations in July 2019.

44 Presidential Decree No. 242, dated 31 May 2005.
45 Presidential Decree No 341, dated 26 December 2005.
46 Decree of the Cabinet of Ministries No. 467, dated 18 November 2016.
47 Decree of the Cabinet of Ministers "On Approval of Rules Ensuring State Control over Formation and Application of State Regulated Tariffs (Prices) No. 247, dated 30 December 2005.
48 Presidential Decree on establishing Azerbaijan Energy Regulatory Agency and approving the Agency's Charter N: 1750, dated 22 December 2017.

4.1. Electricity tariffs

Tariff menu

Electricity tariffs in Azerbaijan have remained relatively stable, with only three major changes in the tariff rates and structure over the last decade (Table 4). It should also be mentioned that there is no long-term energy tariff policy in Azerbaijan and keeping/approving non cost-reflective electricity tariffs is part of the social policy of the country.

Table 4: Dynamics of electricity tariffs (all taxes and levies are included) during 2007–2019, AZN $*10^{-2}$ per kWh

N:	Type of services	From 1 Jan. 2007	From 15 July 2016	From 1 Dec. 2016*
1	**Purchase**			
1.1	Private small hydro power stations	2.5	2.5	5.0
1.2	Wind power stations	4.5	4.5	5.5
1.3	Other alternative and renewable energy sources	-	-	5.7
2	**Wholesale**	**4.1**	**4.3**	**5.7**
2.1	Enterprises of chemical, aluminum, mining, steel industries and data centres for data processing, recording and transmitting connected to 35kV and 110kV lines and with an average monthly consumption not less than 5 million kWh			
2.1.1	Day (08.00 - 22.00)	4.2	4.2	5.8
2.1.2	Night (22.00 - 08.00)	2.0	2.0	2.8
3	**Transmission**	**0.2**	**0.2**	**0.2**
4	**Retail**	**-**	**-**	**-**
4.1	Households	6.0	7.0	-
4.1.1	Households with monthly consumption less than 300 kWh	-	-	7.0
4.1.2	Households with monthly consumption more than 300 kWh	-	-	11.0
4.2	Non-residential (other consumers)	6.0	7.0	9.0

** Initial tariffs were approved on 28 November 2016 and stipulated 250 kWh as the threshold of the first block, however on 22 December 2016 the Tariff Council made amendments to its decision and increased the threshold to 300 kWh per month.*

Source: Energy Charter Secretariat based on the Decisions of the Tariff Council: No. 3 dated 6 January 2007, No. 11 dated 14 July 2016, No. 17 dated 28 November 2016, No. 20 dated 22 December 2016 (correction to the decision of Tariff Council No. 17 dated 28 November 2016), No. 10 dated 19 December 2017.

The existing tariff menu in Azerbaijan includes the following tariffs:

- Purchase tariffs – de facto used as feed-in tariffs for RES;
- Wholesale electricity price – the purchase price of the DSO from the TSO network. In fact, the Tariff Council does not approve separate tariffs for the large hydro and thermal power plants owned by Azerenerji and therefore the wholesale price includes all related generation and transmission costs;
- Time-of-use tariffs for the energy intensive companies of specific industries;
- Transmission tariff – de facto the tariffs paid by the DSO for the transmission of electricity produced by its wind power plant (see Table 2);
- Inclining block tariffs for residential consumers, where the first block of 300 kWh per month is billed using a lower tariff;

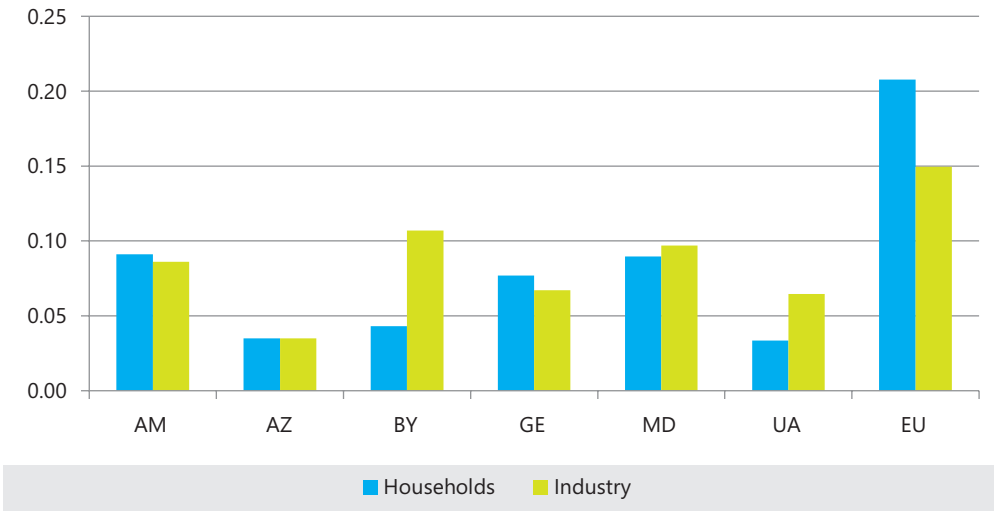
- Flat rate tariff for all other consumers regardless of the category, voltage or capacity.

Table 4 also indicates that the latest major changes in the tariff policy were related to the introduction of the block tariffs for residential consumers as well as the approval of the FITs for other alternative and renewable energy sources in December 2016. It should additionally be noted that the initial introduction of block tariffs and higher tariffs for monthly consumption above 250 kWh resulted in social discontent in December 2016. Therefore, according to the instruction of the President of Azerbaijan, the Tariff Council retrospectively increased the initial threshold of the first block from 250 kWh to 300 kWh per month. According to the MoEn, the increase of the first block facilitated an increase in the share of population that would not be affected by the tariff raise from 72% to 80%.[49]

Subsidies

A comparison of average electricity tariffs in Azerbaijan with other EaP countries and the EU reveals that Azerbaijan's electricity tariffs in 2016 were among the lowest in the region (Figure 23). The results of price gap estimation analysis, based on average export prices[50] and the opportunity cost of export to neighbouring countries, shows that direct subsidies to electricity consumers varied from 511M USD in 2015 to 313M USD in 2017. Total estimated subsidies during 2015–2017 were at the level of 1.3 billion USD, which is lower than the 1.9 billion USD of fossil fuel subsidies estimated for the same period by the Organisation for Economic Co-operation and Development (OECD) and the International Energy Agency (IEA).[51]

Figure 23: Electricity tariffs in EaP and EU as of March 2016, euro/kWh



Source: INOGATE Updated Baseline Survey, 2016

49 https://www.trend.az/azerbaijan/business/2701648.html (accessed July 2019).
50 Export statistics of Electricity and Natural Gas (Annual Reports of the State Customs Committee of Azerbaijan Republic, available at https://customs.gov.az/en/faydali/gomruk-statistikasi/xarici-ticaretin-veziyyeti-haqqinda (accessed July 2019).
51 IEA's World Energy Outlook 2018, available at https://www.iea.org/weo/ (accessed July 2019).

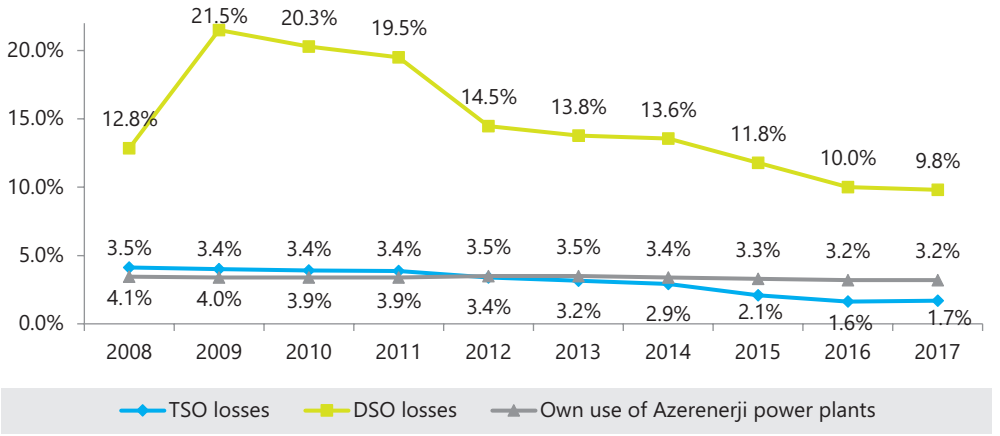
The non-cost-reflective electricity tariffs for residential consumers and the lack of differentiation of tariffs for other consumers depending on the category, voltage and capacity also indicate that there is a significant share of cross-subsidies between categories of consumers. However, the lack of available data makes it impossible to quantify the approximate level of cross-subsidies.

Losses and energy industry own use

There are no specific regulatory incentives aimed at reducing operational costs or improving the efficiency of generating, transmission and distribution facilities in Azerbaijan. On the contrary, the "cost plus" tariff methodology provides the wrong incentives for utilities to increase their costs in order to justify the higher need for the regulated revenue. At the same time, the Government of Azerbaijan has invested more than 5 billion USD in the power sector (electricity production, distribution and supply) over the last ten years (see Table 1), stimulating improvements in the quality of supply and the reduction of losses.

Indeed, Figure 24 shows that electricity losses have decreased over the last decade. The own use of power plants belonging to Azerenerji, the largest electricity producer in Azerbaijan (see Table 2), fell from 3.5% in 2008 to 3.2% in 2017 of the plants' output to the transmission network.

Figure 24: Dynamics of electricity losses in the network and own use of Azerenerji power plants, 2008–2017, % to input



Source: State Statistics Committee, 2019
Ministry of Energy, 2019

Figure 24 also illustrates that the most significant reduction was observed in the transmission network, where the losses fell from 4.1% to 1.7% of the input to the TSO system during 2008–2017. The distribution losses grew from 12.8% in 2008 to 21.5% in 2009 and gradually decreased to 9.8% in 2017 (see Chapter 9.2). Despite these results, the Strategic Road Map of Public Utilities Development[52] further requires Azerishig to reduce its network losses to 7% in Baku and 8% in the regions by 2020.

52 Approved by Presidential Decree No. 1138 dated 6 December 2016.

TSO and DSO network quality

As of September 2019, there was no regulatory framework for monitoring power quality indicators. At the same time, according to the information provided by AERA, the draft rules for the calculation of the System Average Interruption Duration Index (SAIDI) and the System Average Interruption Frequency Index (SAIFI) as well as the methodology for the calculation of consumer compensations for exceeding the threshold levels of these indicators were submitted to the Government for approval. It should also be noted that Azerishig has already started publishing information about its SAIDI and SAIFI indicators of Baku city on its corporate website.[53]

4.2. Natural Gas Tariffs

Tariff menu

Similarly to the dynamics of the electricity tariffs, natural gas tariffs have been relatively stable over the last decade as non-cost-reflective natural gas tariffs remain part of the social policy of the country (Table 5).

The existing tariff menu in Azerbaijan includes the following tariffs:

- Tariff for processing raw natural gas and producing 'pipeline quality' dry natural gas;
- Transportation – an internal tariff that is used by SOCAR to determine the revenue of Azerigaz related to natural gas transportation;
- Wholesale price – the purchase price of the Azerigaz PU from the Azerineft PU, where the latter extracts natural gas;
- Inclining block tariffs for residential consumers, where the first block of 2,200 m^3 per year is billed using a lower tariff;
- Flat rate tariff for all other consumers regardless of the category, volume or pressure level;
- Tariffs for power-generating facilities consuming more than 10 million m^3 per month.

Table 5 also shows that in December 2013, the Government of Azerbaijan reduced direct subsides via natural gas tariffs for chemical, aluminium, mining and steel, but decreased the threshold for power generation facilities from 15 to 10 million m^3 per month. At the same time, the tariff for power-generating facilities almost doubled in 2013 and was further increased by 50% in 2016.

The latest major changes in the tariff policy were related to the introduction of the block tariffs for residential consumers in December 2016. It should also be noted that the initial introduction of block tariffs and higher tariffs for monthly consumption above 1,500 m^3 per year resulted in social discontent in December 2016. Therefore, according to the instruction of the President of Azerbaijan, the Tariff Council retrospectively increased the initial threshold of the first block from 1,500 m^3 to 1,700 m^3 per annum. According to the MoEn, the increase of the first block enabled a greater share of the population to remain unaffected by the tariff raise from 72% to 80%.[54] According to the Tariff Council, it is estimated that the further increase of the first block to 2,200 m^3 per year from 1 May 2019 additionally increased the share of the population consuming gas within the limit of the first block to about 85%.[55]

53 https://www.azerishiq.az/page/acilmalar-saidi-saifi (accessed August 2019).
54 https://www.trend.az/azerbaijan/business/2701648.html (accessed July 2019).
55 http://www.tariffcouncil.gov.az/?/az/news/view/172/ (accessed August 2019).

Table 5: Dynamics of natural gas tariffs (all taxes and levies are included) during 2007–2019, AZN per cubic metres

N:	Name of services	From 8 Jan. 2007	From 1 July 2009	From 3 Dec. 2013	From 1 Dec. 2016	From 1 May 2019
1	**Natural gas processing**	5.5	5.5	5.5	5.5	5.5
2	**Transportation (per 100 km)**	2.0	2.0	2.0	2.0	2.0
3	**Wholesale price to gas distributors***	42	42	42	75	75
4	**Retail**	-	-	-	-	-
4.1	Residential**	47.2	100	100	-	-
4.1.1	Annual consumption up to 1,700 m^3 (including 1,700 m^3)**	-	-	-	100	-
4.1.2	annual consumption above 1,700 m^3**	-	-	-	200	-
4.1.1	Annual consumption above 2,200 m^3 (including 2,200 m^3)	-	-	-	-	100
4.1.2	Annual consumption above 2,200 m^3	-	-	-	-	200
4.2	Non-residential	100	100	100	200	200
5	**Chemical, aluminium, mining, steel industry and power generation facilities that consume natural gas for production purposes with direct access to main gas pipelines and with a monthly consumption of at least 15 million m^3**	42	42	-	-	-
6	**Power generation facilities that consume natural gas for production purposes with direct access to main gas pipelines with a monthly consumption of at least 10 million m^3**	-	-	80	120	120

** The Decision of Tariff Council No. 10 dated 30 December 2009 clarifies that the royalty is included in the wholesale tariffs (see Section 4.4)*

*** Initial tariffs were approved on 28 November 20016 and stipulated 1,500 m^3 as the threshold of the first block, but on 22 December 2016 the Tariff Council made amendments to its decision and increased the threshold to 1,500 m^3 per year*

Source: Energy Charter based on the Decisions of Tariff Council No. 2 dated 8 January 2007, No. 12 dated 14 March 2007, No. 3 dated 30 June 2009, No. 13 dated 2 December 2013, No. 18 dated 28 November 2016, No. 19 dated 22 December 2016 and No. 2 dated 30 April 2019

As of September 2019, about 60% of households are equipped with smart natural gas meters and have moved to prepaid services.[56]

Subsidies

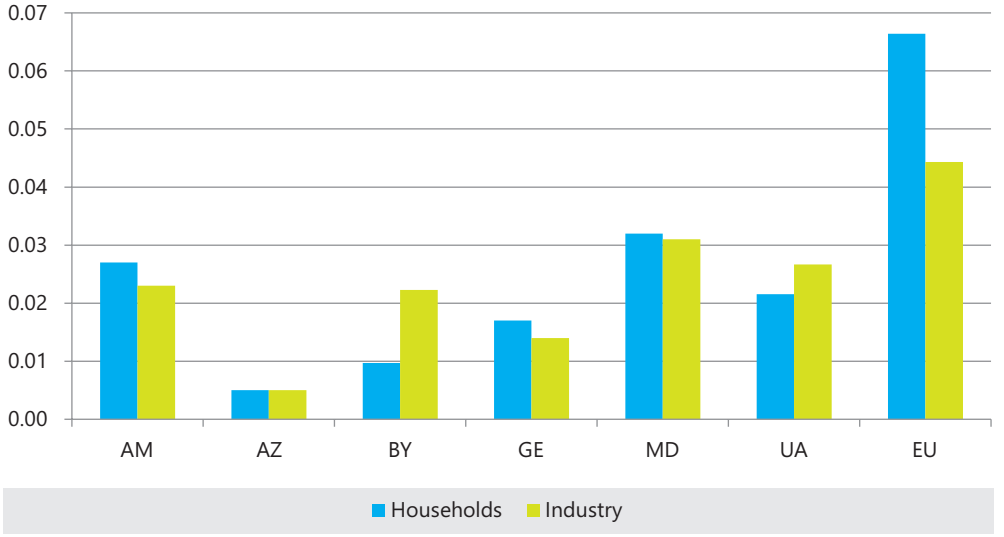
A comparison of average natural gas tariffs in Azerbaijan with other EaP countries and the EU shows that Azerbaijan's natural gas tariffs were the lowest in the region in 2016 (Figure 25). The results of the price gap estimation analysis, based on average export prices[57] and the opportunity cost of export to neighbouring countries, shows that direct

56 According to the information provided by Azerigaz OJSC during a peer review mission to Baku on 16-18 September 2019 (see Annex 5).

57 Export Statistics of Electricity and Natural Gas (Annual Reports of the State Customs Committee of Azerbaijan Republic, available at https://customs.gov.az/en/faydali/gomruk-statistikasi/xarici-ticaretin-veziyyeti-haqqinda (accessed July 2019).

subsidies to natural gas consumers varied from 695M USD in 2015 to 555M USD in 2017. The total estimated subsidies during 2015–2017 were at the level of 1.9 billion USD, thus higher than the 1.6 billion USD of natural gas subsidies estimated for the same period by the OECD/IEA.[58]

Figure 25: Natural gas tariffs in EaP and EU countries as of March 2016, euro/kWh



Source: INOGATE Updated Baseline Survey, 2016

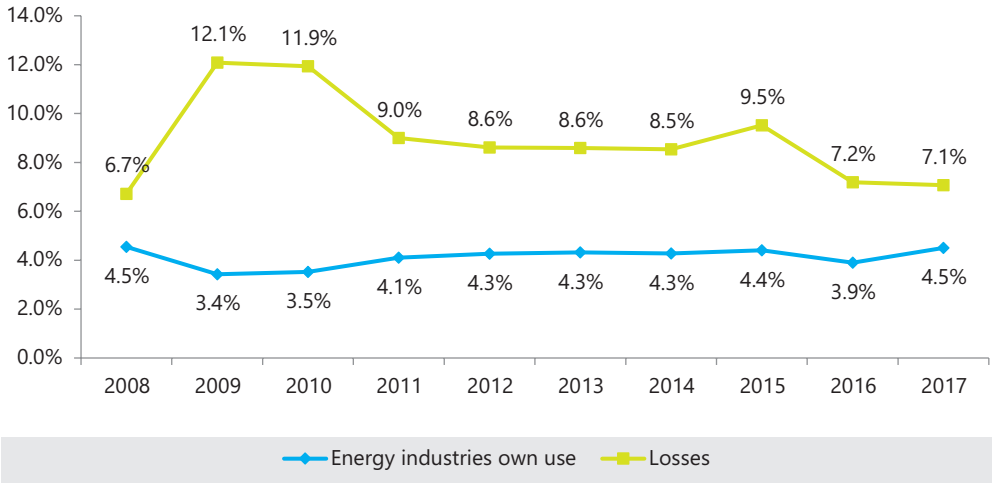
Losses and energy industries' own use

There are no specific regulatory obligations or incentives to reduce operational costs or to improve the efficiency of processing, transmission and distribution of natural gas in Azerbaijan. On the contrary, the "cost plus" tariff methodology provides the wrong incentives for utilities to increase their costs in order to justify the higher need for the regulated revenue. Table 1 also shows that state investments in the natural gas sector were relatively small compared to oil and natural gas extraction sectors, amounting to 270M USD during 2008–2017.

Taking into account the fact that natural gas transmission, storage and distribution services are provided by the vertically integrated Azerigaz PU (see Section 3.2), there are no separate statistics on natural gas transmission and distribution losses. Figure 26 shows that the relative level of the total natural gas losses increased almost twofold in 2009 and has been gradually decreasing ever since, except for in year 2015. However, the level of natural gas losses in 2017 was higher than in 2008. The level of the energy industry's own use fluctuated between 3.4% and 4.4% during 2009–2016 and reached its highest level of 4.5% at the beginning and end of the period analysed.

58 IEA's World Energy Outlook 2018, available at https://www.iea.org/weo/ (accessed July 2019).

Figure 26: Dynamics of natural gas losses and own use in 2008–2017, % to input



Source: State Statistics Committee, 2019

4.3. Heat Tariffs

Tariff menu

Similarly to the dynamics of the electricity tariffs, heat gas tariffs have also remained relatively stable over the last decade, as non-cost-reflective heat tariffs are part of the social policy of the country (Table 6).

Table 6: Dynamics of tariffs for services provided by Azeristiliktejhizat JSC, District Heating Company (all taxes and levies are included) during 2007–2019, AZN

N:	Types of services	Consumer groups	Tariff (AZN per)	from 1 Dec. 2011	from 1 Jan. 2017
I	Central heating	1. Population	m^2 of living area	0.15 (monthly)	0.15 (monthly)
		2. Non-population	m^3 of heated volume	0.25 (monthly)	0.25 (monthly)
			Gcal (for consumers with heat meters)	30,0	30,0
II	Hot water*	1. Population	m^3	0.4	1.92
			Gcal	8.0	-
		2. Non-population	m^3	1.5	3.1
			Gcal	30.0	-

** Tariffs for hot water were excluded from the list of the state-regulated tariffs (prices) of goods, services and works according to the Cabinet of Ministries Decree No. 467 dated 18 November 2016. Since 1 January 2017, hot water services are no longer regulated by the Tariff Council and defined by Azeristiliktejhizat JSC.*[59]

Source: Energy Charter based on the Decisions of Tariff Council No. 4 dated 24 November 2011 and No. 13 dated 28 November 2016

59 http://www.e-qanun.az/framework/34179 (accessed August 2019).

The existing tariff menu in Azerbaijan includes the following tariffs for central heating:

- Depending on the living area (without heat meters);
- Depending on the heated volume of premises (without heat meters) – the most commonly used method due to the absence of heat meters;
- Depending on the heat consumed (with heat meters).

Since 1 January 2017, central hot water supply tariffs are no longer regulated by the Tariff Council and defined by the Azeristiliktejhizat JSC.

Subsidies

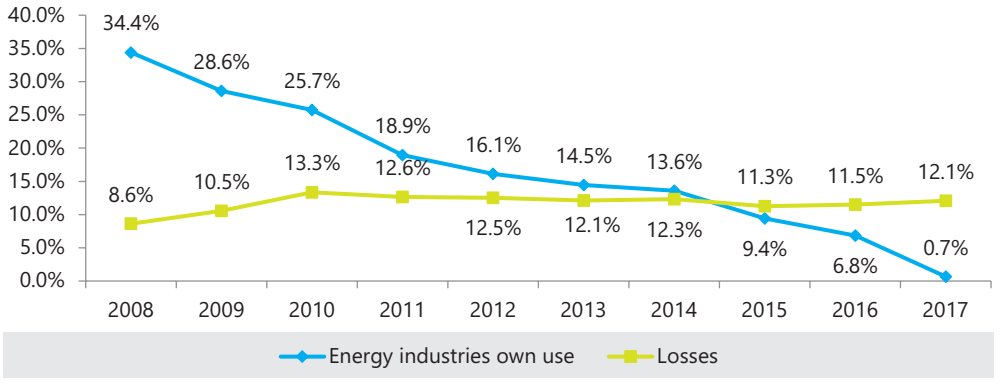
Azeristiliktejhizat JSC every year receives direct subsidies from the state budget that cover the difference between actual costs and approved tariffs. The direct state subsidies for the period of 2016–2019 allocated by the state budget were equal to around 60M USD or 103M AZN, including 18M AZN in 2016, 18.9M AZN in 2017 and 33M AZN per year in 2018 and 2019.[60]

Losses and energy industries' own use

There are no specific regulatory obligations or incentives to reduce operational costs or to improve the efficiency of heat distribution and production in Azerbaijan. On the contrary, the "cost plus" tariff methodology provides the wrong incentives for utilities to increase their costs in order to justify the higher need for the regulated revenue. Table 1 also shows that state investments in the heat sector were lower than in other sectors, amounting to 190M USD during 2008–2017.

Figure 27 shows that the level of heat losses increased from 8.6% in 2008 to 13.3 in 2010 and gradually decreased until 2015. In 2016–2017, the heat losses again achieved an increasing trend. At the same time, it should be noted that this figure mainly represents calculated losses, as there is a very low level of availability of heat meters in Azerbaijan. The level of the energy industry's own use decreased dramatically from 34.4% at the beginning of the analysed period to 0.7% in 2017, mainly due to the disconnection of the energy industry (mainly oil refinery) from the Baku CHP.

Figure 27: Dynamics of heat losses and own use in 2008–2017, % to input



Source: State Statistics Committee, 2019

60 According to the Presidential Decrees on the application of the annual Laws of the Azerbaijan Republic "About the State Budget of the Republic of Azerbaijan for 2019", "About the State Budget of the Republic of Azerbaijan for 2018", "About the State Budget of the Republic of Azerbaijan for 2017" and "About the State Budget of the Republic of Azerbaijan for 2016", available at http://www.maliyye.gov.az/static/103/dovlet-budcesi-haqqinda-qanunlar-ve-fermanlar (accessed August 2019).

4.4. Subsidies for Vulnerable Consumers

There are no direct subsidies for vulnerable consumers; this consumer group is protected by the tariff policy and inclining block tariffs with a social rate for the first tariff block. The Government of Azerbaijan is also fighting with energy poverty by constantly improving access to the natural gas and heat network (see Sections 3.2 and 3.3)

4.5. Taxes and Other Charges

Natural gas, electricity, heat

The same level of 18% value-added tax (VAT) is applied for natural gas, electricity and heat. As of September 2019, there are no other direct taxes or levies related to these energy commodities.

Fuel

Oil refinery products produced and sold in Azerbaijan include the following taxes:

- VAT – 18%;
- Road tax – 0.02 AZN per litre of petrol, diesel or liquefied gas;[61]
- Excise duty – as of September, the excise duty varied from 2% to 66% depending on the type of fuel (Table 7).

Table 7: The price breakdown of the most common oil refinery products produced and sold in Azerbaijan, as of September 2019

Product	Company internal tariffs	Excise		Supply tariff (VAT included)	Wholesale tariff (VAT included)	Road tax	Retail tariff (VAT included)	
	AZN/ton	%	AZN/ton	AZN/ton	AZN/ton	AZN/ton	AZN/ton	AZN/litre
Petrol AI-95	468.58	64.0	299.89	15.0	921.8	26.2	1048.0	0.80
Petrol AI-92	619.36	42.0	260.13	15.0	1052.8	26.2	1179.0	0.90
Petrol AI-80	396.06	66.0	261.40	15.0	790.8	26.2	917.0	0.70
Diesel	413.10	18.0	74.36	15.0	590.2	23.8	714.0	0.60
Jet fuel	415.95	9.0	37.44	15.0	550.0			
Nafta	224.99	13.0	29.25		300.0			
LNG	183.10	22.0	40.28		263.6	36.4		
Mazut	185.13	3.0	5.55	15.0	240.0			
Kerosene	318.42	32.0	101.89	12.0	508.0		558.0	0.45

Source: Energy Charter based on the Resolution of the Cabinet of Ministers of Azerbaijan No.1 dated 07 January 2007 with amendments

61 Tax Code, Chapter XV. Road tax, Article 211.

A deeper analysis of historical data also suggests that the excise duties have been used as an instrument to stabilise the level of fuel prices in case of a change in the company's internal prices.

Royalty

As of September 2019, the Tax Code of Azerbaijan stipulates the following royalty rates for the use of natural resources:[62]

- Crude oil – 26%;
- Natural gas – 20%;
- Mining all types of metals – 3%.

4.6. Emissions Trading

As of September 2019, there were no emissions trading schemes in Azerbaijan or any plan to introduce such a scheme.

62 Tax Code, Chapter XV. Road tax, Article 216.

Summary: Energy Pricing Policy

The Tariff Council is the leading responsible authority for the approval of energy tariffs in Azerbaijan. Although the Council was officially cut off from state budget funding in January 2019 and there is now a new Energy Regulatory Agency, the Council remains functional based on the voluntary representation of all concerned state authorities. AERA was established in December 2017 as a public legal entity that is subordinate to the MoEn. After the adoption of the draft Law on the Regulator, which was developed with the support of the EBRD, all functions related to the calculation and approval of energy tariffs should be transferred from the Tariff Council to AERA.

Electricity tariffs in Azerbaijan were relatively stable during 2008–2017, seeing only three major changes in tariff rates and structure. The latest changes were related to the introduction of inclining block tariffs for residential consumers and purchase prices from generators using alternative and renewable energy sources. The recent tariff changes led to social discontent and resulted in a retrospective threshold increase of the first tariff block from 250 kWh to 300 kWh per month in December 2016.

Similarly to the dynamics of electricity tariffs, natural gas tariffs have also been relatively stable. The latest changes in the tariff policy were also related to the introduction of inclining block tariffs. The initial first block of 1,500 m^3 per year was retrospectively increased to 1,700 m^3 in December 2016 and further increased to 2,200 m^3 in May 2019.

There were no changes to district heating tariffs over the last decade, except the deregulation of hot water prices in November 2016. After the removal of hot water tariffs from the list of the state-regulated tariffs (prices), Azeristiliktejhizat JSC increased hot water tariffs by almost five times in January 2017. Despite this significant increase, hot water tariffs remain below the cost-reflective level.

Existing energy tariffs in Azerbaijan are determined based on a general "cost plus" methodology and there are no separate rules as to the calculation of electricity, natural gas and heat tariffs. Under the current tariff methodology, there are no incentives for utilities to improve the cost-efficiency of their services. On the contrary, the methodology provides wrong incentives to increase operational costs to justify a higher need for the regulated revenue. Targets for the reduction of energy losses are envisaged only for electricity network operators.

The tariff system includes cross-subsidies between consumer groups and energy carriers as well as direct subsidies from the state budget. The non-cost-reflective energy tariffs are part of the social policy of the country. The results of the price gap estimation analysis, based on average export prices and the opportunity cost of export to neighbouring countries, show that direct subsidies to electricity, natural gas, and heat consumers exceeded 3.2 billion USD during 2015–2017. Energy tariffs in Azerbaijan are also among the lowest in the region.

5. Energy and Energy Efficiency Policy

5. Energy and Energy Efficiency Policy

5.1. Strategic Framework

As of September 2019, there is no long-term energy strategy in Azerbaijan and the strategic energy policy framework includes the following key documents:

- Development Concept "Azerbaijan 2020: A Look into the Future", adopted by Presidential Decree No. 800 dated 22 December 2012;
- 12 Strategic Roadmaps (SRM) approved by Presidential Decree No. 1138 dated 6 December 2016.

Development concept "Azerbaijan 2020: A Look into the Future"

The development concept approved by the President of Azerbaijan in December 2012 sets the main strategic goals for policy development in all economic areas of country. In terms of the energy sector, the document contains a declared goal to align the amount of energy used for the production of one unit of GDP and the amount of carbon dioxide emissions in Azerbaijan with the appropriate indicators of OECD countries. The document also sets the following priorities in the field of sustainable energy:

- The modernisation of the oil-gas and petrochemical sectors;
- The broader use of alternative and renewable energy and the application of energy efficiency measures.

At the same time, the concept's energy-related targets are neither specific nor measurable, rendering it very difficult to monitor or evaluate progress.

12 Strategic Roadmaps

The 12 Strategic Roadmaps (SRM) constitute the most recent set of strategic documents that were approved by the Decree of President of Azerbaijan No. 1138, dated 6 December 2016. The main SRM is called the "Strategic Road Map on National Economy Perspectives". It is accompanied by 11 Sector Roadmaps: (i) agriculture; (ii) oil and gas; (iii) logistics and trade (transport); (iv) industry (heavy industry and machinery); (v) SME development; (vi) financial services; (vii) technical and vocational education; viii) telecommunications; ix) public utilities; x) tourism; and xi) social housing. Each SRM also includes corresponding action plans. The energy-related strategy, targets and action plans are outlined in the three main documents:

1. SRM on National Economy Perspectives;
2. SRM on Oil and Gas Industries (Including Chemical Products) Development (restricted);
3. SRM on Public Utilities (Including Electricity, Heat, Gas, and Water) Development.

The SRM on National Economy Perspectives includes the following strategic energy-related directions for the period after 2025:

- While continuing the exploitation of its rich natural resources, Azerbaijan will pay more attention to environmental protection and carbon emissions reduction;
- Based on the energy efficiency principle, the energy spent to produce each unit of GDP will be minimised;

- The share of renewable types of energy will be increased in Azerbaijan's energy balance;
- Improved efficiency and quality of service in electricity supply, water supply and sanitation, heating and gas supply sectors.

At the same time, neither the SRM nor the accompanying action plan have specific and measurable energy-related targets. Among its strategic targets, the SRM envisages the strengthening of fiscal sustainability and the adoption of sustainable monetary policy with regard to the management of oil and gas revenues and the privatisation and reform of state-owned energy utilities.

The SRM on Oil and Gas Industries Development is a restricted document and the main strategic goals for this sector are not publicly available.

The Strategic Road Map on Public Utilities Development outlines general global trends in electricity and natural gas and includes specific energy-related targets that form part of the action plan for the period 2016–2020, a medium-term review for the pre-2025 period and a target review for the post-2025 period (see Section 5.3).

Other related documents

In addition to the abovementioned strategic documents, in July 2015 the Minister of Energy approved "10 Strategic Tasks" aimed at introducing market-based reforms in Azerbaijan, including the following:

1. Preparation of a strategy for the energy sector development of the country in the next 25-30 years;
2. Development of a 15-20-year State Programme for the efficient use of energy resources, improvement of end user energy efficiency and the use of alternative energy sources;
3. Development of a 5-year State Programme for energy sector development (1st Five-year Strategic Development Plan);
4. Development of a draft law on the regulated internal market of electricity;
5. Development of a draft law on the regulated internal market of natural gas;
6. Development of a draft law "On Grid Code" for electricity;
7. Development of a draft law "On Grid Code" for natural gas;
8. Development of a draft law "On Independent Energy Regulator" governing the internal energy (electricity and gas) markets;
9. Restructuring of the power system structures (Azerenerji, Azerishiq) based on the new subjects of the market provided by the legislation;
10. Creation of a flexible tariff system, reflecting and distributing the interests of end-consumers and other market actors (X-factor) and based on the costs of products and services.

It should also be noted that the document does not stipulate a timeframe for the implementation of these tasks. As a result, as of September 2019, only Task 9 related to the TSO and DSO unbundling was fully completed (see Chapter 3.1) while other tasks are at different stages of implementation/development.

In May 2019, the President of Azerbaijan issued a new Presidential Decree on "the Acceleration of Reforms in the Energy Sector of Azerbaijan".[63] The distinctive feature of this Decree is that it assigns specific responsibilities and sets deadlines for their development for the Cabinet of Ministers and the Ministry of Energy. Among other tasks, the MoEn was officially assigned to develop the following:

- Long-term Energy Strategy, Law on RES, Law on the Regulator, Law on Energy and Law on Natural gas (within 12 months);
- Proposals for improving the efficiency of electricity and natural gas systems (within 6 months);
- Proposals for the creation of a favourable climate for RES, promotion and attraction of private investments (within 4 months).

With regard to the development of the Long-term Energy Strategy of Azerbaijan, the MoEn has already solicited support and started cooperating with the European Commission (EC). In June 2019, the EC announced the Framework Contract (FWC) tender on "Support to the Government of Azerbaijan to Develop the Energy Sector". The objective of the FWC is to assist the Ministry of Energy in developing a long-term energy strategy analysing various policy options and development scenarios. The project was due to start in September 2019 with a duration of 10 months.

5.2. Legal Framework for Energy Efficiency

As of September 2019, the main driving force for the implementation of reforms and updating/development of the legislative framework on energy markets, energy efficiency and renewable energy, is the Presidential Decree on "The Acceleration of Reforms in the Energy Sector of Azerbaijan", which stipulates strict timeframes for the development and submission for approval of draft laws (see Chapter 5.1).

The following sections of this chapter provide a short overview of the key elements of the legal framework related to energy efficiency, particularly:

- Energy-related laws;
- Energy efficiency law;
- Energy performance in buildings;
- Energy-related products;
- Exemplary role of the public sector;
- Energy services;
- Energy efficiency in industry;
- Vehicle fuel efficiency;
- Energy efficiency obligation schemes;
- Financial incentives or tax concessions.

Energy-related laws

The energy-related legislative framework of Azerbaijan is rather outdated as all key laws were adopted during 1996-1999. As of September 2019, the country's energy sector is mainly regulated by the following laws:[64]

63 Presidential Decree No. 1209 dated 29 May 2019.
64 http://www.minenergy.gov.az/index.php/az/qanunverilicik?id=15 (accessed August 2019).

- The Law on the Use of Energy Resources (30 May 1996, No. 94-IQ);
- The Law on Subsoil (13 February 1998, No. 439-IQ);
- The Law on Power Sector (3 April 1998, No. 459-IQ);
- The Law on Gas Supply (30 June 1998, No. 513-IQ);
- The Law on Energy (24 November 1998, No. 541-IQ);
- The Law on Power and Heat Generation Stations (28 December 1999, No. 84-IG);
- The Law on Environmental Safety (8 June 1999, No. 677-IQ);
- The Law on Environmental Protection (8 June 1999, No. 678-IQ).

There have been a number of recent amendments to the legislative framework, but most efforts of the Government are currently devoted to the development of new laws according to best international practice. Certainly, the MoEn is currently cooperating with the following international organisations on the development of primary legislation acts:

- USAID – draft Law on Power – submitted to the Cabinet of Ministers in July 2018;
- EU4Energy – draft Law on Energy Efficiency – submitted to the Administration of the President in May 2019;
- EBRD – draft Law on the Regulator – submitted to the Cabinet of Ministries for inter-ministerial consultations in July 2019;
- ERSP EU funded – draft Law on RES - under consultations in the MoEn as of September 2019.

Energy efficiency law

The Law on the Use of Energy Resources is the key document regulating the energy efficiency sector of the country. The law defines the legal, economic and social foundation of state policy and regulates the relations between different entities in this area. However, not all provisions of the law have been reinforced since its adoption in 1996. For example, the law stipulates the establishment of an energy fund that has never been created.

The MoEn is currently in the process of adopting a new Law on the Efficient Use of Energy Resources and Energy Efficiency. The draft law, which was prepared in the framework of the EU4Energy programme, passed the inter-ministerial consultation process in 2018 and was submitted to the Administration of the President in May 2019. Once adopted, this law will provide a general framework and define the legal, organisational and economic basis of the state policy in the field of energy efficiency. The scope of the law covers the entire energy chain: exploration of primary energy resources, energy production, transportation, distribution, supply and final use.

Energy performance in buildings

As of September 2019, there are two key documents that regulate the energy performance of buildings in Azerbaijan:

- "MSP-2.04-101-2001" –"Thermal Performance Design of Buildings", approved by the State Committee for Urban Planning and Architecture on 12 December 2002, by Order No. 3;
- Urban Planning and Construction Code approved by Law No. 392 dated 29 June 2012.

The "MSP-2.04-101-2001" is a CIS standard that was developed by the Russian Federation and adopted by the Interstate Scientific-Technical Commission on Standardization, Technical Regulation and Conformity Assessment in Construction in 2001. The standard

was approved by the Committee in 2002 and provides a set of rules, technical solutions and calculation methods that ensure compliance with the construction norms and regulations used in the Former Soviet Union. The State Committee for Urban Planning and Architecture is currently in the process of adopting another CIS Standard "MSN-2.04-02-2004" – "Thermal Protection of the Buildings".

The existing Urban Planning and Construction Code approved in 2012 stipulates that the design of buildings should be developed in accordance with energy saving and energy efficiency requirements. However, such requirements have not yet been developed and adopted. According to the relevant presidential decree on the implementation of this code, a number of secondary legislation/normative acts should be prepared, but this process is rather slow. In March 2014, the Cabinet of Ministries of Azerbaijan approved the "Rules for Improving Energy Efficiency and Energy Saving at Construction Sites".[65] The Rules define general requirements as to energy efficiency in building design. However, the document does not stipulate any specific requirements beyond the development of a Building Energy Performance Certificate that lists the various indicators and parameters of the building envelope, like geometrical and thermal insulation parameters, required energy consumption for building heating and so forth. No other normative requirements in the building envelope with regard to thermal insulation parameters have been established. Compliance with the above requirements is controlled by the Ministry of Emergency Situations of the Republic of Azerbaijan.

To sum up, there are no minimum energy performance requirements for buildings in Azerbaijan, but general design and reporting requirements for building envelopes. However, once adopted, the Law on the Use of Energy Resources will require the implementation of the following policy instruments according to best EU practice:

- Minimum energy performance requirements for new and renovated buildings;
- Energy Performance Certification scheme;
- Compulsory energy audit and designating energy managers for buildings (except residential) with a total construction area of more than 10,000 square metres.

Energy-related products

There is no primary and secondary legislation framework on energy-related products in Azerbaijan. However, once adopted, the Law on the Use of Energy Resources will require the implementation of the following policy instruments:

- Energy labelling;
- Ecodesign requirements.

Exemplary role of the public sector

The Cabinet of Ministries Decree No. 164 dated 12 April 2019 on the approval of "Rules of Determination and Regulation of Limits on the Use of Public Utilities (Electric and Heat Energy, Natural Gas and Water) in Budget Organisations" stipulates the determination of consumption limits based on the following criteria:

- Actual consumption in the previous year;
- Expected consumption in the current year;
- Expected increase in consumption in the next year due to the introduction of new facilities based on technical indicators;

65 Approved by the Decree of the Cabinet of Ministries of Azerbaijan No. 73 dated 11 March 2014.

- Expected reduction in consumption in the next year due to the liquidation of facilities based on actual consumption or technical indicators.

In case of exceeding the established limits, utilities have the right to restrict energy supply to these organisations. However, public organisations still do not have any incentives to reduce energy consumption, including low-cost and no-cost measures. The draft Law on the Use of Energy Resources includes a specific chapter on the Exemplary Role of the Public Sector according to best EU practice.

Energy services

There are no specific provisions in this area, but the draft Law on the Use of Energy Resources includes a specific chapter on the promotion and development of energy services according to best EU practice.

Energy efficiency in industry

There are no specific provisions in this area, but the draft Law on the Use of Energy Resources includes a separate chapter on energy audit, energy management systems (EMS) and energy managers.

Vehicle fuel efficiency

There are no CO_2 emissions standards for cars and vans in Azerbaijan, only minimum toxic emissions standards for new and used vehicles imported to the country. According to the Cabinet of Ministers decision no. 2 dated 14 January 2014, from April 2014 all vehicles imported to Azerbaijan must meet Euro 4 requirements.

Energy efficiency obligation schemes

There are no specific provisions in this area, but the draft Law on the Use of Energy Resources includes a separate chapter on the energy efficiency obligation scheme.

Financial incentives or tax concessions

According to the Cabinet of Ministers Decision "On the List of Imported Goods which Benefit from VAT Exemption",[66] imports of equipment and materials for renewable energy installation and LED lamps are exempt from VAT. The same equipment and materials are also exempt from the customs duty according to the Cabinet of Ministers Decision "On Duties for Export-import Operations".[67]

5.3. National Targets and Action Plans

National Energy Efficiency Action Plans

There is no National Energy Efficiency Action Plan (NEEAP) in Azerbaijan. However, once adopted, the new Law on the Use of Energy Resources (see Section 5.2) will require the development of a five-year NEEAP. Therefore, the Ministry of Energy started developing the NEEAP with the support of the EU-funded EU4Energy programme in May 2019. The draft NEEAP is expected to be completed by May 2020.

66 Cabinet of Ministers Decision No. 11 dated 31 January 2005 (with amendments).
67 Cabinet of Ministers Decision No. 91 dated 22 April 1998 (with amendments).

It should also be noted that there have already been a number of attempts to develop NEEAPs in the last decade. In 2011, the Short-term Action Plan on Energy Efficiency for 2011–2012 was developed in the framework of the EU Energy Reform Support Programme (ERSP) and was approved by the Minister of Industry and Energy by Order No. 19 of 24 May 2012. Another document – an integrated energy strategy covering the supply, transportation, transit and use of all energy resources – had been prepared within the same framework and submitted to the Cabinet of Ministries in June 2012, but was not approved. In 2015 the Ministry developed a State Programme and an Action Plan "On the Efficient Use of Energy Resources and Energy Efficiency of End Consumers", but these documents were also not adopted.

Master Plan for the Reconstruction and Development of Electricity Distribution Networks in Cities and Regions of the Republic of Azerbaijan (2016–2025)

The "Master Plan for the Reconstruction and Development of Electricity Distribution Networks in Cities and Regions of the Republic of Azerbaijan (2016–2025)" was prepared and approved by the Cabinet of Ministers on 11 April 2016.

The Plan envisages $4.6 billion of total investment in distribution network improvements during 2015–2025. The ADB selects priority investment components and provides about $1.0 billion of investments for the implementation of the Plan. The immediate priority for investments is the rehabilitation of distribution networks with frequent system outages and supply interruptions. The key performance indicators (KPIs) of the ADB investment programme by 2022 are as follows: average annual unserved energy due to outages is reduced to less than 1% of energy sales (baseline: 7% in 2014); nationwide distribution network losses are reduced to 8% (baseline: 16% in 2014); and the revenue collection rate is increased to 95% (baseline: 70% in 2014).[68]

Action Plan on SRM on National Economy Perspectives

The Action Plan does not include any specific targets related to renewable energy and energy efficiency and instead envisages a specific target related to the reduction of transfers from the State Oil Fund of the Republic of Azerbaijan (SOFAZ) to the state budget. The Action Plan outlines that as of 2015, every second AZN spent in the public sector was financed by transfers from SOFAZ. Therefore, the Action Plan calls for this figure to be reduced to 15% by 2025.

Action Plan of the "Strategic Road Map on Public Utilities (Electricity, Gas, Heat and Water) Development"

The Action Plan identifies the following specific indicators/targets to be achieved by 2020:

Electricity generation and supply

- Total increase of generation capacity by 1,000 MW and its diversification with 350 MW of solar energy, 50 MW of wind energy (in addition to the already planned 900 MW) and 20 MW of solar energy;
- Increase the net fuel efficiency of selected combined-cycle power plants by up to 50%;
- Reduce electricity losses in the DSO network from 8.5% to 7.0% in Baku and from 12% to 8% in the regions;

68 Proposed Multitranche Financing Facility Azerishiq Open Joint-Stock Company Power Distribution Enhancement Investment Program, Report and Recommendation of the President to the Board of Directors, May 2016, available at https://www.adb.org/sites/default/files/project-document/180161/42401-014-rrp.pdf (accessed August 2019).

- Export of natural gas saved as a result of increased efficiency to Europe through TAP/TANAP projects;
- Provide 50% of Georgia's and 20% of Turkey's electricity imports.

Natural gas supply

- Reduction of technical losses of natural gas distribution to below 8%;
- Export of natural gas saved as a result of increased efficiency to Europe through TAP/TANAP projects.

District heating

- Increase the volume of heat energy production from 427,000 Gcal at the 2015 level to 1,767,000 Gcal;
- Expand the coverage of heat supply by increasing the number of residential consumers to 5,689 (increase by 50.4% compared with 2017);
- Increase the income of heat-generating plants by 5.1M AZN in total;
- Improve the heat supply through the renovation of heating systems in about 550 residential buildings.

According to the progress report issued by the Centre for Analysis of Economic Reforms and Communication that was set up by the Presidential Decree in April 2016, 55% of the actions envisaged for 2017 were completed. Actions related to improving the efficiency of power plants and their efficient utilisation were fully implemented. The lowest levels of performance were observed regarding the targets related to increasing the efficiency of power plants, ensuring the efficient use of existing capacity (42%) and minimising all losses associated with the distribution of natural gas (43%).[69]

5.4. Institutional Framework

The Ministry of Energy (MoEn) is the central executive authority that implements state policy in the energy sector. The former Ministry of Energy and Industry was reorganised into the Ministry of Energy and functions related to the industrial sector were transferred to the Ministry of Economy (MoE) in October 2013.[70] According to the Statute of the Ministry,[71] the Ministry of Energy:

- Participates in forming a unified state policy in the energy sector and ensures the implementation of this policy;
- Ensures the implementation of measures related to the efficient use of energy resources and protection of public interests in this area;
- Participates in regulating the activities of state-owned enterprises operating in the field of energy (in cases that are prescribed in the Statute of the Ministry);
- Takes measures for the efficient use of state property in the energy sector;
- Provides the implementation of common scientific-technical policy in the field of energy and defines its main guidelines;
- Ensures the development of the energy sector;
- Ensures its regulatory role in the energy sector.

69 http://iqtisadiislahat.org/store//media/documents/SYX/2017/11_Kommunal_opt.pdf (accessed August 2019).
70 According to Executive Order No. 3 of the President of the Republic of Azerbaijan No. 3 Dated 22.10.2013.
71 Approved by Presidential Decree No. 149 dated 11 April 2014, available at http://www.e-qanun.az/framework/27517 (accessed July 2019).

Functions as to the development of energy policies related to energy efficiency, renewable energy and environmental protection are assigned to the Energy Efficiency and Ecology Department of the Ministry. As of September 2019, the Department employs eight full-time staff members, including the Head.

The Energy Regulatory Agency (AERA) was established in December 2017[72] as the public legal entity (PLE) under the subordination of the Ministry of Energy. The agency was created on the basis of two structures of the MoEn: the State Energy Control Department and the State Gas Control Department.

The main responsibilities[73] of the Agency include the regulation of relations between producers, transmission and distribution companies, suppliers and consumers in the field of electricity, natural gas and thermal energy. The AERA also analyses enterprises' activities, proffers proposals on restructuring measures and tariff policy, develops incentive mechanisms for attracting investments and controls compliance with quality requirements for network operators. Since 2018, the AERA has been an associate member of the Energy Regulators Regional Association (ERRA).

The Tariff (Price) Council is a collegial executive body exercising the state regulation of prices (tariffs) and service fees that are subject to the state regulation.[74] Apart from energy tariffs, the Council implements the state regulations in other sectors of economy. According to the Resolution of the Cabinet of Ministers "On Approval of the List of Goods (Services, Works) whose Prices (tariffs) are Regulated by the State",[75] the Council reviews and sets tariffs (prices) of about 50 various types of goods (services, works). The regulated entities are required to provide economic justifications for the expenses recovered by the tariffs. The calculated tariffs are reviewed by the Tariff Council and published upon approval.

Members of the Council include Deputy Ministers of Finance, Taxes, Justice, Energy, Agriculture, Health, Education, Transport, Communications and High Technologies, Labour and Social Protection as well as Deputy Heads of the State Customs Committee and State Committee on Urban Planning and Architecture.[76] The Chairman of the Council is the Minister of Economy. In January 2019, the Secretariat of the Tariff (Price) Council was abolished, although it remains functional based on the voluntary representation of all involved ministries and state authorities.[77]

The Ministry of Economy (MoE) was established on 15 January 2016 as the successor of the Ministry of Economic Development (established on 30 April 2001) and the Ministry of Economy and Industry (established on 22 October 2013) of the Republic of Azerbaijan.

According to the Ministry's Statute,[78] the MoE is the central executive authority responsible for the development of the economic policy and preparation of economic and social forecasts as well as the implementation of state policy on developing the economy, sustainable development, investments promotion and protection, development of entrepreneurship,

72 Presidential Decree on establishing the Azerbaijan Energy Regulatory Agency and approving the Agency's Charter No. 1750 dated 22 December 2017.
73 http://www.minenergy.gov.az/index.php/en/ministry?id=55 (accessed August 2019).
74 According to the Statute approved by Presidential Decree No. 341 dated 26 December 2005.
75 Resolution of the Cabinet of Ministers No. 178 dated 28 September 2008.
76 http://www.tariffcouncil.gov.az/?/en/content/48/ (accessed August 2019).
77 According to Presidential Decree No. 464 "On Additional Measures to Improve Public Administration in the Republic of Azerbaijan" dated 14 January 2019.
78 Adopted by Presidential Decree No. 111, dated 20 February 2014.

competition, protection of consumer rights, domestic trade, foreign economic and trade relations and the socioeconomic development of the regions of the country.

The functions regarding the development of policies related to the improvement of EE in industry are assigned to the Industry Department of the Ministry. As of September 2019, the Department employs 11 full-time staff members, including the Head.

The Ministry of Ecology and Natural Resources (MoENR) was established by President Decree No. 485 on 23 May 2001. Its Statute was approved on 18 September 2001.[79] The Ministry is the central executive body implementing state policy on the preservation of the environment, the efficient use of natural resources and their restoration as well as the regeneration and increase of soil fertility, their monitoring, geodesy and cartography in the territory of the Republic of Azerbaijan and the Azerbaijani sector on the shelf of the Caspian Sea.[80]

The functions of the coordination of the GHG inventory are assigned to the ***Climate Change and Ozone Centre*** established under the MoENR. As of September 2019, the Centre employs 20 full-time staff members who lead work on the preparation of National Communications, Biennial Reports and other documents within the United Nations Framework Convention on Climate Change (UNFCCC).

The Ministry of Transport, Communications and High Technologies was established by Presidential Decree on 13 February 2017 on the basis of the abolished Ministry of Communications and High Technologies and the Ministry of Transport of the Republic of Azerbaijan.

According to the Statute of the Ministry approved by Presidential Decree dated 12 January 2018,[81] it is the central executive body that implements state policy and regulation in the areas of transport (including maritime and civil aviation), communications and high technologies.

Baku Transport Agency was established in November 2016 under the subordination of the Cabinet of Ministries. The aim of the Agency is to ensure the safe, uninterrupted and comfortable traffic of vehicles and pedestrians within the administrative territory of Baku, including the provision of a centralised management of traffic flows and the introduction of an intelligent transport management system.

The Ministry of Agriculture was established in 1993. According to the latest regulation approved by the President of Azerbaijan No. 226 dated 20 April 2005, the Ministry is the central executive body that implements state policy in the agricultural sector, including the production and processing of agricultural products, the provision of essential services to producers, veterinary care, plant protection and quarantine and the efficient use of land.

The State Committee of Urban Planning and Architecture was established by Presidential Decree No. 1339 dated 20 February 2006 on the basis of the State Committee of Construction and Architecture. The Statute[82] of the Committee was approved by Presidential Decree No. 647 dated 9 November 2007. According to the Statute, the Committee is the central executive body that implements state policy and regulation in the areas of urban planning and architecture. The State Committee for Urban Planning and Architecture is also

79 http://eco.gov.az/post/1101 (accessed August 2019).
80 Ibid.
81 https://www.e-gov.az/en/news/read/630 (accessed August 2019).
82 https://www.arxkom.gov.az/10/komitenin_esasnamesi.htm (accessed August 2019).

responsible for adopting standards related to the energy performance of buildings and the implementation of the existing Urban Planning and Construction Code.

The State Agency on Alternative and Renewable Energy Sources (SAARES) was established in 2009 as a part of the Ministry of Industry and Energy.[83] The main purpose of the Agency was to increase the efficient use of energy resources by utilising the country's alternative and renewable energy sources.[84] In 2012, the SAARES was liquidated and replaced by "The State Company for Alternative and Renewable Energy Sources of the Republic of Azerbaijan".[85] In February 2013, another Presidential Decree upgraded the status of the SAARES to the central executive authority that implements state policy and regulations in the field of alternative and renewable energy and its efficient use as well as effective management, coordination and state control in the sector.[86] According to the same Presidential Decree, "The State Company for Alternative and RES" was reorganized into "Azalternativenerji" LLC, subordinate to SAARES.

In November 2016, after four years of independence, the SAARES was again subordinated to the MoEn as a public legal entity,[87] before being abolished in January 2019 together with the Secretariat of the Tariff (Price) Council.[88] The functions of the SAARES were partially transferred to the Energy Efficiency and Ecology Department of the Ministry of Energy.

The State Statistical Committee is the central executive authority[89] running state policy in the field of statistics and forming official statistics on the social, economic, demographic and ecological situation of the country on the basis of a unified methodology.

The Centre for Analysis of Economic Reforms and Communication was established as a public legal entity by Presidential Decree No. 879 dated 20 April 2016.[90] The objectives of the Centre are to develop proposals for the implementation of economic reforms based on macro- and microeconomic analysis in order to ensure the sustainable economic development of the country. The Centre is also responsible for the preparation of mid- and long-term forecasts.

83 According to the Presidential Decree No. 123 dated 16 July 2009, available at http://e-qanun.az/alpidata/framework/data/18/f_18085.htm (accessed August 2019).
84 According to the "State Program on Alternative and Renewable Energy Sources in the Republic of Azerbaijan" approved by Presidential Decree No. 462 in October 2004, available at http://www.e-qanun.az/framework/18085 (accessed on July 2019).
85 Approved by Presidential Decree of 1 June 2012, available at https://president.az/articles/5071 (accessed August 2019).
86 http://e-qanun.az/framework/25200 (accessed August 2019).
87 According to the Presidential Decree No. 1125 "On Improvements in the Public Administration" dated 24 November 2016.
88 According to the Presidential Decree No. 464 "On Additional Measures to Improve the Public Administration in the Republic of Azerbaijan" dated 14 January 2019.
89 According to the regulation approved by Presidential Decree No. 1250 dated 13 April 2010, the State Statistical Committee of the Republic of Azerbaijan.
90 http://ereforms.org/pages/nizamname-4 (accessed August 2019).

Summary: Energy and Energy Efficiency Policy

As of 2019, there is no energy strategy in Azerbaijan, although the MoEn has already started cooperating with the EU to develop a long-term energy strategy. The main driving force for implementing reforms and updating the legislative framework is the Presidential Decree on "The Acceleration of Reforms in the Energy Sector of Azerbaijan". The Decree stipulates responsible authorities and strict deadlines for the development and submission for approval of relevant draft legislative acts.

The 12 SRMs constitute the most recent set of adopted strategic documents. The main act is the "Strategic Road Map on National Economy Perspectives", which is accompanied by 11 Sector Roadmaps, some of which are restricted. The main SRM and those on Oil and Gas Industries (Including Chemical Products) Development and Public Utilities (Including Electricity, Heat, Gas, and Water) Development are the key documents related to the energy sector. The main SRM does not have measurable energy-related targets and the SRM on Oil and Gas is restricted. The SRM on Public Utilities includes specific goals for power, including renewables, natural gas and district heating sectors until 2020.

The Legal Framework for Energy Efficiency is outdated and mainly includes legislative documents developed during the 1990s. There have been some recent amendments to the legislative framework. Still, most efforts of the GoA are devoted to the development of new laws according to the best international practice. The Law on the Use of Energy Resources is the key document regulating energy efficiency. The law defines the legal, economic and social foundation of state policy and governs the relations between different entities in this area. However, not all provisions of the law have been reinforced since its adoption in 1996. The MoEn is currently in the process of adopting a new Energy Efficiency Law with the support of the EU4Energy project.

There is no NEEAP in Azerbaijan. However, once adopted, the new Law on EE will require the development of a five-year NEEAP. Therefore, in 2019, the MoEn started developing the NEEAP with the support of the EU4Energy project. In 2011 and 2015, there were also attempts to develop state EE programmes, but neither document was adopted.

The institutional framework for energy efficiency includes multiple stakeholders and the MoEn is the leading responsible authority for the development and implementation of energy policies related to energy efficiency, renewable energy and environmental protection. However, there is a lack of coordination of EE-related activities in industry, buildings and transport sectors.

6. Renewable Energy Policy

6. Renewable Energy Policy

6.1. Potential of Renewable Energy Sources

Due to its geographical location, the Caspian Sea and its diverse landscape of plains and mountains (see Chapter 1.1), Azerbaijan has significant potential for the utilisation of its renewable energy sources.

Solar energy

The estimated solar energy technical potential of Azerbaijan is 23,040 MW.[91] According to the State Programme on the Use of Alternative and Renewable Energy Sources in the Republic of Azerbaijan adopted in 2004,[92] the annual duration of the country's solar radiation varies between 2,400 and 3,200 hours or 1,500 to 2,000 kWh/m^2. As of September 2019, there are six solar PV installations with an installed capacity exceeding 1 MW, namely Nakhchivan Solar Power Plant – 24 MW, Gobustan Solar Power Plant – 3,0 MW, Surakhani Solar Power Plant – 1.56 MW, Pirallahi Solar Power Plant – 1.1 MW, Samukh Solar Plant – 1.93 MW and Sumgayit Solar Power Plant – 2.17 MW. In total, 37.2 MW of solar PV have been installed across the country, including at social establishments and on the roofs of various public buildings (see Table 2).

Wind energy

Azerbaijan has excellent potential for the utilisation of its wind resources, especially in coastal areas along the Caspian Sea. According to the Ministry of Energy, the technical potential for wind is estimated at 3,000 MW. This potential is reflected in the government's target of 350 MW of new capacity by 2020. As of September 2019, about 66 MW have been installed, with 55.3 MW operated by Azerishiq OJSC, 2.7 MW by Azalternativenergy LLC and 8 MW by the private sector (see Table 2).

Bioenergy

The estimated biomass and waste-to-energy technical potential of Azerbaijan is 300 MW. At present bioenergy is mostly utilised in the form of traditional biomass, largely for heating and cooking in remote areas. In addition, there is significant potential for generating energy from household biodegradable waste. Moreover, the Baku Waste-to-Energy Plant with an installed capacity of 37 MW is manifesting ongoing government efforts to realise this potential.

Small hydro

The estimated small hydro technical potential of Azerbaijan is 520 MW. However, only 5% of this technical potential is currently being utilised, including SHPPs of independent power producers generating power for their own needs.

In October 2018, the Ministry of Energy and BP signed a letter of intent to improve the performance of small hydro power plants. As a result of this cooperation, the SNC-Lavalin's Atkins Company[93], a selected consultant, is to conduct an assessment to improve the efficiency

91 Ministry of Energy, A General Overview of the Use of Alternative and Renewable Energy at Global and Azerbaijan Level http://minenergy.gov.az/index.php/az/?option=com_content&view=article&id=323 (accessed September 2019).
92 Approved by Presidential Decree No. 462 dated 21 October 2004.
93 Available at https://www.bp.com/en_az/caspian/press/pressreleases/bp_and_moe_sign_letter_of_intent_on_tech_assistance.html (accessed September 2019).

of existing small hydro power plants in the regions in order to enhance the hydro-energy potential of small mountain rivers. This assignment has already commenced with the collection of information and the undertaking of field visits.[94]

6.2. Existing RES Legislative Framework

As of September 2019, there is no regulatory framework for the development of RES in Azerbaijan, except for specific purchased tariffs (de facto FIT) for electricity produced from SHPP, wind and other alternative and renewable energy sources (see Chapter 4.1). In 2014, the State Agency on Alternative and Renewable Energy Resources developed a draft state strategy on the use of alternative and renewable energy sources for the period 2015–2020, but the document was not approved.

The main strategic goals for RES policy development are set forth by the "Azerbaijan in 2020: Look into Future" state strategy (see Chapter 5.1). The document stipulates the development of renewable energy sources, strengthening the institutional environment, increasing scientific-technical potential, continuing training specialists and raising awareness among consumers. However, it does not stipulate any specific targets related to RES development.

The specific RES targets are envisaged by the SRM on public utilities. The document sets a target of 420 MW of new installed RES capacities by 2020, including 350 MW of wind, 50 MW of solar and 20 MW of bioenergy (see Chapter 5.3). At the same time, the document does not specify any targets for small hydro. The SRM also consists of a long-term vision for 2025 and beyond, but no specific targets are set for the period after 2020. A comparison of technical RES potential, 2020 targets and installed RES capacities is presented in Table 8.

Table 8: Renewable energy resources potential and installed electricity capacity, as of September 2019

Renewable energy source	Technical potential capacity, MW	SRM 2020 target, MW	Installed capacity, MW, 2019	Potential/ installed, %	SRM 2020 target/ installed, %
Solar	23,040	50	37.2	0.2%	74.3%
Wind	3,000	350	66.0	2.2%	18.9%
Bio/waste	380	20	38.0	10.0%	190.0%
Small hydro	520	No target	25.0	4.8%	-

Source: Energy Charter Secretariat based on Ministry of Energy, 2019

6.3. Planned RES Policies and Measures

The Presidential Decree "On Accelerating Reforms in the Energy Sector of the Republic of Azerbaijan" dated 29 May 2019 assigns the Ministry of Energy to develop and submit to the President of the Republic of Azerbaijan the following documents:

- Within 4 months (end of September 2019), proposals to stimulate the use of renewable energy sources, create a favourable investment climate in this area and support the activities of private entrepreneurship;
- Within 12 months (end of May 2020), a draft law of the Azerbaijan Republic "On Renewable Energy Sources in Electricity Production".

94 According to the MoEn's Report for the 1st half of 2019 http://minenergy.gov.az/index.php/en/news-archive/504-measures-have-been-taken-to-expand-the-use-of-renewable-energy-sources-in-the-first-half-of-this-year (accessed August 2019).

In 2019 the Ministry of Energy also strengthened its cooperation with donor organisations and international companies in order to attract investment in the renewable energy sector. In the framework of the TA project "Assistance to the Ministry of Energy in Development of Renewable Energy Legal Framework" implemented with financial support from the EU (started in late 2018), a draft Law on RES, a model Power Purchase Agreement and a Connection Agreement have all been developed and submitted to the MoEn for consultations.

The EBRD assists the Ministry of Energy with a TA project titled "Support for the Implementation of Renewable Energy Auctions in Azerbaijan", which commenced in early September 2019 and includes the following scope of expected activities:

1. Finalise the selection of a site for developing a wind power project from a shortlist based on technical, environmental and financial feasibility;
2. Develop a detailed design for a competitive bidding process for supporting renewable energy, accounting for current arrangements, renewable energy targets and the market context;
3. Prepare, up to the final version, all the tender-related documentation required for the deployment of a competitive procurement scheme for a solar PV project and a wind power project;
4. Provide detailed technical, financial and legal assistance to the relevant authorities for the implementation of the competitive procurement scheme for a renewable power project.

ADB is also planning to construct the first floating solar PV plant with a capacity of 100 kW in Azerbaijan in order to enhance national capacity, knowledge and technical skills in designing, constructing and operating floating solar PV plants. The full list of ongoing TA projects is provided in Annex 4. Apart from donor organisations, a number of internationally recognised companies like BP, Equinor, Total, Masdar, Tekfen and Mitsui Co have also expressed their interest in developing the RES sector in Azerbaijan and have signed corresponding MoUs.[95]

95 According to the MoEn's Report for the 1st half of 2019 http://minenergy.gov.az/index.php/en/news-archive/504-measures-have-been-taken-to-expand-the-use-of-renewable-energy-sources-in-the-first-half-of-this-year (accessed August 2019).

Summary: Renewable Energy Policy

Due to its geographical location, the Caspian Sea and its diverse landscape of plains and mountains, Azerbaijan has significant potential to utilise its RES. The highest technical potential belongs to solar (23 GW) and wind (3GW), but the country also has good potential for small hydro (0.5GW) and biomass (0.4GW).

The SRM on Public Utilities envisages specific targets for the installation of new RES capacities by 2020. At the same time, the document does not specify any targets for small hydro. In 2019, the country exceeded its target for bioenergy, but needs to make extra effort to achieve its solar and wind-installed capacity targets. There are no specific targets for RES development beyond 2020 and they should be part of the long-term energy strategy being developed with the support of EU.

There is no regulatory framework for the development of RES in Azerbaijan, aside from specific purchase tariffs for electricity produced from alternative and renewable energy sources. The Presidential Decree on "The Acceleration of Reforms in the Energy Sector of Azerbaijan" assigns specific responsibilities to the MoEn for the development of RES law and for creating a favourable climate for private investments in renewables. To fulfil its assigned obligations, the MoEn actively cooperates with donor organisations and international companies. Namely, the Ministry collaborates with the EU on the development of the RES legislative framework, the EBRD on the Implementation of Renewable Energy Auctions and the ADB on the construction of the first floating solar PV plant.

7. Environmental and Climate Change Policies Related to Energy

7. Environmental and Climate Change Policies Related to Energy

In October 2016, the Government of Azerbaijan established a National Coordination Council for Sustainable Development (NCCSD). The main objective of the Council is to align national programmes and priorities with the Sustainable Development Goals (SDGs). The Secretariat of the Council is hosted by the Ministry of Economy. The Deputy Prime Minister of Azerbaijan is officially appointed as Chair of the Council and the Minister of Economy as Deputy Chair. Other ministries and state bodies are mainly represented at the level of deputy ministers. At the same time it should be mentioned that the Ministry of Energy is not represented at the Council despite the fact that SDG 7: "Ensure access to affordable, reliable, sustainable and modern energy for all" and SDG 13 "Take urgent action to combat climate change and its impacts" are directly related to the energy sector.

On 28 October 2016, the Milli Mejlis (the Parliament of Azerbaijan) ratified the Paris Agreement with the country's commitment to reduce GHG emissions by 35% in 2030. Therefore, the national target of Azerbaijan, set as an intended nationally determined contribution (INDC), is a 35% reduction of GHG emissions by 2030 compared to the base year 1990. In absolute values, the country should achieve total emissions reductions equal to 25.7 $MtCO_2e$ excluding land use, land-use change and forestry (LULUCF) activities or 24.4 $MtCO_2e$ when including LULUCF compared to 1990.

The Second Biennial Update Report of the Republic of Azerbaijan submitted to the UNFCC in September 2018 does not stipulate the breakdown of the target per sector. At the same time, the report indicates that 79.6% of total emissions in 2013, the year of the last inventory, were emitted by the energy sector (Table 9).[96]

Table 9: Dynamics of GHG emissions and absorptions per sectors, 1990–2013 $MtCO_2e$

Sector	1990	2000	2005	2010	2011	2012	2013	2030 target	2030-2013
Energy	63.9	33.0	39.2	36.6	46.2	47.8	49.2	-	-
Industry	1.4	0.6	1.8	2.1	2.3	3.4	3.4	-	-
Agriculture and forestry	6.3	5.4	6.5	7.2	8.2	8.5	8.5	-	-
Waste	1.7	1.8	2.0	2.3	0.7	0.7	0.8	-	-
Total emissions	**73.3**	**40.8**	**49.5**	**48.2**	**57.5**	**60.3**	**61.8**	**47.7**	**-14.2**
% to previous period	-	*-44%*	*21%*	*-3%*	*19%*	*5%*	*2%*	*-23%*	-
Removal	-3.7	-4.9	-5.3	-5.4	-7.4	-7.8	-8.0	-2.4	5.6
Net emissions	**69.6**	**35.9**	**44.1**	**42.8**	**50.0**	**52.6**	**53.9**	**45.3**	**-8.6**
% to previous period	-	*-48%*	*23%*	*-3%*	*17%*	*5%*	*2%*	*-16%*	-

Source: Energy Charter Secretariat based on the Second Biennial Update Report of the Republic of Azerbaijan to UNFCCC, 2018

96 The full report is available at https://unfccc.int/sites/default/files/resource/Second%20Biennial%20Update%20Report%20-%20Azerbaijan-version%20for%20submission.pdf (accessed September 2019).

A deeper analysis of Table 9 reveals significant changes in the dynamics of total GHG emissions that can be explained based on the following key factors:

- A decrease in GHG by 44% during 1990-2000 – mainly due economic shutdown after the collapse of the Soviet Union in 1991and the use of natural gas instead of oil in the energy generation sector;
- Increase by 21% during 2000-2005 – economic recovery of the country;
- Decrease by 3% during 2005-2010 – results of the reduction of associated petroleum gas (APG) flaring and venting by SOCAR during 2008–2010 (see Chapter 9.3 for more details);
- Increase by 19% in 2011 and an increasing trend during 2012–2013 – the application of Intergovernmental Panel on Climate Change (IPCC) 2006 Guidelines for 2011–2013, including more sources of fugitive emissions than the Revised 1996 Guidelines as well as increases in total final consumption (see Figure 12) and natural gas production (see Figure 18) during these years.

Table 9 also indicates that Azerbaijan further needs to reduce its total emissions by 23% by 2030 to achieve its INDC target compared to the latest available data of 2013. The country also needs to reduce net emissions by 16% to reach the 2030 targets (including LULUCF). The difference between the distances to the 2030 target is explained in the Second Biennial Update Report of the Republic of Azerbaijan to UNFCCC. Indeed, the Report highlights the efforts of the GoA related to forest restoration and rehabilitation works as well as orchard planting in agricultural lands that resulted in increased GHG absorption by more than two times during 1990–2013.[97]

As of September 2019, there is no official action plan on the activities aimed at achieving GHG targets. At the same time, some climate mitigation and adaptation issues are included in the 12 Strategic Roadmaps (see Chapter 5.1) as well as in the following programmes:

- State Programme for the Development of Industry in the Republic of Azerbaijan (years 2015–2020);
- State Programme for the Development of Viticulture in the Republic of Azerbaijan in 2012–2020 years.

According to information obtained during the peer review mission of September 2019 (see the agenda of the mission in Annex 5), the Ministry of Ecology and Natural Resources together with the United Nations Development Programme (UNDP) is currently working to prepare the Third Biennial Report and the National Action Plan to meet INDC targets.

97 The Second Biennial Update Report of the Republic of Azerbaijan to the UNFCCC also provides absorption figures calculated based on updated IPCC 1996 and 2006 methods.

Summary: Environmental and Climate Change Policies Related to Energy

In October 2016, the Parliament of Azerbaijan ratified the Paris Agreement with the country's commitment to reduce GHG emissions by 35% in 2030 compared to the base year 1990. The state submitted its Second Biennial Update Report to the UNFCCC in 2018. According to the report, Azerbaijan needs to reduce its total emissions by 23% or net emissions by 16% to reach the 2030 targets. The difference between total and net emission targets relates to the forest and biodiversity restoration achievements of the government during 1990–2013.

A more profound analysis indicates that the significant reduction of total emission was related to the economic shutdown after the collapse of the Soviet Union in 1991 and the fuel switch from oil to natural gas in the energy generation sector. This means that the country still needs to make extra efforts to decouple its economic growth and energy consumption to reach its GHG targets by 2030.

As of 2019, there is no official action plan on the activities aimed at achieving GHG targets. The Ministry of Ecology and Natural Resources, together with the UNDP, is currently working to prepare its Third Biennial Report and a national action plan to meet its INDC targets.

8. Finance and International Assistance

8. Finance and International Assistance

The EU is the largest provider of financial assistance to Azerbaijan in the energy sector. This support is mainly based on the EU-Azerbaijan Partnership and Cooperation Agreement signed in 1999 as well as cooperation within the Eastern Partnership policy initiative inaugurated in 2009. During 1996-2006, Azerbaijan was a member country of the INOGATE Programme, one of the longest-running TA programmes funded by the EU. In total, Azerbaijan benefited from 33 of the 69 projects funded by INOGATE.[98] In April 2016, the EU concluded the INOGATE and launched a new EU4Energy programme that covers EU support in improving energy supply, connectivity, promotion of energy efficiency and the use of renewables in all EaP countries, including Azerbaijan.[99]

In 2013, INOGATE assisted the Ministry of Energy of Azerbaijan in designing an institutional framework to improve energy efficiency in the country. As a result of this project, in May 2014 the MoEn created the Energy Efficiency and Ecology Department, which is currently responsible for the development of energy policies related to energy efficiency, renewable energy and environmental protection (see Chapter 5.4).

At the same time, a number of recommendations developed within INOGATE projects during 1996-2015 have never been implemented. This statement is also supported by the results of the EC Budget Support Programme implemented during 2010–2012. As part of this programme, the EU provided 13M euros to the GoA to develop a comprehensive legislative framework on Energy Efficiency and Renewable Energy. As a result of the support programme, the following legislative documents were developed:[100]

- National Strategy on the Use of Alternative and Renewable Energy Sources (RES) for 2012–2020 – submitted to the Cabinet of Ministries, but not approved;
- Action Plan on Renewable Energy Sources (short-term and mid-term) – adopted by the Order of the Ministry of Energy No. 28 dated 5 July 2013, but not implemented;
- Action Plan on Energy Efficiency (short-term and mid-term) – adopted by the Order of the Ministry of Energy No. 28 dated 5 July 2013, but not implemented;
- Law on Alternative and Renewable Energy Sources – submitted to the Cabinet of Ministers, but not approved;
- Law on Energy Efficiency – submitted to the Cabinet of Ministers, but not approved;
- 21 secondary legislative documents – submitted to the Cabinet of Ministers, but not approved.

However, the dynamics identified as regards the weak enforcement of policy reforms in EE and RES fields completely changed in 2017. The strong position of the GoA with regard to the implementation of energy reforms also contributed to negotiations for a new framework agreement on mutually beneficial cooperation in 2017. Moreover, the new agreement is related to the development of the Shah Deniz Stage 2 gas production field and the Southern Gas Corridor that can additionally deliver 10 bcma of gas to the EU market (see Chapter 3.2 for more details). Funding for both the production field and the Southern Gas Corridor was provided by the EU financial institutions EIB and EBRD. By securing 3.9 billion euros, the TAP became the largest European infrastructure project in 2018.[101]

98 INOGATE & Azerbaijan, available at http://www.inogate.org/countries/2?lang=en (accessed September 2019).
99 https://energycharter.org/partners/eu4energy/overview/ (accessed September 2019).
100 INOGATE Updated Baseline Survey, April 2016, available at https://library.euneighbours.eu/content/updated-baseline-survey-partner-countries-institutional-and-regulatory-frameworks-sustaina-0 (accessed September 2019).
101 More information is available at https://www.eib.org/en/press/all/2019-004-trans-adriatic-pipeline-tap-completes-successful-eur-3-9-billion-project-financing (accessed September 2019).

As of September 2019, the GoA actively cooperates with the following donor and international organisations in the sustainable energy field: EU/EU4Energy, EBRD, ADB and USAID. The latter developed the first draft Law on the Electricity Market and presented it to Azeri stakeholders in January 2018, before being further improved and presented to the President of Azerbaijan in September 2019. Full lists of recently completed and ongoing projects supported by donor organisations in Azerbaijan are provided in Annexes 3 and 4, respectively. Apart from donors' assistance to state institutions, the UNDP cooperates with SOCAR on the implementation of the Nationally Appropriate Mitigation Actions (NAMAs) for low-carbon end-use sectors project.[102]

The EBRD's current portfolio in sustainable infrastructure in Azerbaijan accounts to 1,055M euros. During 1998-2018, the bank funded eight energy-related projects, including the abovementioned Shah Deniz Stage 2 and the Southern Gas Corridor.[103] Apart from funding, the EBRD also provides TA projects related to the establishment of an independent regulator and the development of the RES sector in Azerbaijan (see Annex 4).

ADB's assistance in the energy sector comprises 13 projects accounting to 1,200M USD.[104] ADB is currently very active in providing technical assistance to the Ministry of Energy of Azerbaijan with regard to the preparation of Power Sector Financial Recovery Plans and financing the construction of the first floating solar energy plant, with a capacity of 100 kW (see Annexes 3 and 4).

102 More information is available at http://www.az.undp.org/content/azerbaijan/en/home/projects/nationally-appropriate-mitigation-actions--namas--for-low-carbon.html (accessed September 2019).
103 More information is available at https://www.ebrd.com/work-with-us/project-finance/project-summary-documents.html?c2=on&s2=on&s10=on&keywordSearch= (accessed September 2019).
104 https://data.adb.org/dashboard/azerbaijan-numbers (accessed September 2019).

Summary: Finance and International Assistance

The EU is the largest provider of financial assistance to Azerbaijan in the energy sector. This support is mainly based on the EU-Azerbaijan Partnership and Cooperation Agreement and the EaP policy initiative.

The identified dynamics of the low enforcement of policy reforms in EE and RES fields completely changed in 2017, when the Government of Azerbaijan initiated major energy reforms. The new impetus to tackle energy markets, sustainable energy and climate change challenges contributed to negotiations over a new framework agreement on mutually beneficial cooperation between the EU and Azerbaijan. The new agreement is also related to the development of the Shah Deniz Stage 2 gas production field and the Southern Gas Corridor that can additionally deliver ten bcma of gas to the EU market. Funding for these projects was in part provided by the EU financial institutions EIB and EBRD. By securing 3.9 billion euros, the TAP became the largest European infrastructure project in 2018.

As of 2019, Azerbaijan is a part of the EU4Energy initiative, which supports the improvement of energy supply, connectivity, promotion of energy efficiency and the use of renewables. The Government of Azerbaijan also cooperates with ADB, the USAID and other international financial institutions and donor organisations in the energy field.

9. Assessment of Energy Efficiency Potential and Policies at the Sectoral Level

9. Assessment of Energy Efficiency Potential and Policies at the Sectoral Level

9.1. General Assessment

9.1.1. Overview of Energy Efficiency Strategic and Legislative Frameworks

There is no energy strategy or other strategic document in Azerbaijan that establishes energy efficiency targets or officially recognises the role of energy efficiency for the sustainable development of the country. Over the last decade the Government of Azerbaijan (GoA) has made a number of efforts to develop a comprehensive strategic framework on energy efficiency (Table 10).

Table 10: Efforts of the GoA to develop a comprehensive strategic framework on EE

Title	Year	Status (as of September 2019)
Action Plan on Energy Efficiency (short-term and mid-term) for 2011–2012	2011	Approved by the Ministry of Industry and Energy in July 2013, but not implemented
National Energy Strategy	2012	Submitted to the Cabinet of Ministers in June 2015, but not approved
State Programme and an Action Plan "On Efficient Use of Energy Resources and Energy Efficiency of End Consumers"	2015	Not adopted
"10 Strategic Tasks" that stipulated the development of: - A long-term energy strategy; - An action plan for EE and RES; - The unbundling of the power sector; - Tariff reforms.	2015	Approved by the Ministry of Energy in July 2015. Only 1 out of 10 tasks was fully completed and other tasks are still at the different stages of implementation/development
Law on Energy Efficiency that requires setting EE targets and the development of the NEEAP	2018	Submitted to the administration of the President in May 2019
"Acceleration of Reforms in the Energy Sector of Azerbaijan", which stipulates the development of: - A long-term energy strategy; - Proposals to improve the efficiency of electricity and natural gas systems.	2019	Approved by Presidential Decree in May 2019. Under implementation/development
National Energy Efficiency Action Plan (NEEAP)	2019	Under development

Source: Energy Charter Secretariat,2019

Table 10 clearly illustrates the lack of political will to implement reforms in the field of energy efficiency during 2007-2015, with little effort seen to adopt and implement the documents developed in close cooperation with international organisations (see Chapter 5). However, the adoption of the new Presidential Decree on "the Acceleration of Reforms in the Energy Sector of Azerbaijan"[105] aims to dramatically change this tendency, assigning specific responsibilities and setting deadlines for the Cabinet of Ministers and the MoEn.

105 Presidential decree No. 1209 dated 29 May 2019.

9.1.2. Overview of the Energy Tariff Policy

The predominant barrier preventing overall energy efficiency improvements and the implementation of energy efficiency measures by private consumers pertains to the tariff policy, which is poorly designed and executed. The analysis presented in Chapter 4 indicates that energy tariffs in Azerbaijan are among the lowest in the region and are heavily subsidised by the GoA. The results of the price gap estimation analysis, based on average export prices[106] and the opportunity cost of export to neighbouring countries, shows that direct subsidies to electricity, natural gas and heat consumers exceeded 3.2 billion USD during 2015–2017 (Table 11).

Table 11: Estimated energy subsidies in 2015–2017, M USD

	2015	2016	2017	Total
Electricity	511	438	313	1,261
Natural gas	695	662	555	1,912
Heat	11	11	19	41
Total	**1,217**	**1,111**	**887**	**3,215**

Source: Energy Charter Secretariat, 2019

Shortfalls in cost recovery year on year have resulted in Azeri energy utilities becoming loss-making enterprises, with survival depending on state budget transfers. This conclusion is also supported by the Centre for Economic and Social development (CESD), an Azeri think tank that claims that the inefficient regulation of the revenue of Azerenerji resulted in the year-to-year financial losses of the company and the blackout of the power system of Azerbaijan on 8 July 2018.[107] As an example, CESD indicates that despite significant transfers from the state budget, the financial losses of Azerenerji amounted to 350M USD in 2017.

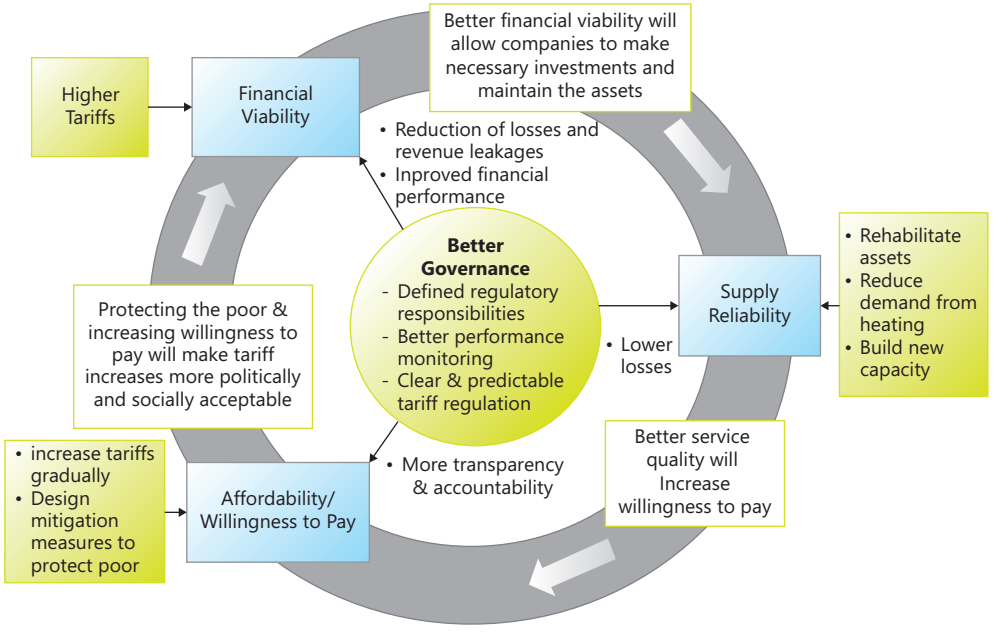
The substantial growth in energy demand during the period of stable prices and the significant reduction in energy consumption after the efforts of the GoA to increase energy tariffs exemplifies the inefficiency of the current tariff system. The non-cost-reflective energy tariff approach as a feature of the country's social policy has resulted in there being a large number of consumers who are able to pay cost-reflective prices while still benefiting from subsidised tariffs.

The lack of long-term energy tariff policy also resulted in social commotion in the country in December 2016, when the GoA introduced block tariffs for electricity and natural gas consumers. As a result, the decision of the Tariff Council to set block tariffs was amended: the thresholds for the lowest electricity tariffs were increased from an initial 250 kWh per month to 300 kWh and for natural gas from 1,500 to 1,700 m^3 per year in December 2016 and from 1,700 to 2,200 m^3 per year in May 2019.

106 Export statistics of Electricity and Natural Gas (Annual Reports of the State Customs Committee of Azerbaijan Republic, available at https://customs.gov.az/en/faydali/gomruk-statistikasi/xarici-ticaretin-veziyyeti-haqqinda (accessed July 2019).
107 Azerbaijan's Country-wide Electricity Blackout: Problems, Causes, and Results, CESD, 2018, available at http://cesd.az/new/wp-content/uploads/2018/07/CESD_Energy_Paper.pdf (accessed August 2019).

The problem related to acceptance of energy tariff increases is rather common in the Former Soviet States and in many studies is described as a 'vicious circle' that connects consumers' acceptance of tariff increases, utility performance and utility financial viability (Figure 28). It follows that to facilitate consumers' acceptance of tariff reforms that might provide sufficient funds to develop the electricity system in a cost-effective manner, tariff increases should be linked to better governance, resulting in transparent, clear and predictable regulation of energy monopolists.

Figure 28: Vicious circle involving consumers' acceptance of tariff increases, utility performance and utility financial viability



Source: World Bank , 2014

Another important aspect is that 2016 was the first year when the country started importing natural gas and the volume of imported gas increased from 1.6% of gas production in 2016 to 11.6% in 2017 (See Chapter 2.4). Such a high level of natural gas imports and additional losses for the country could have been completely avoided had the government implemented effective tariff policy, stimulating the efficient utilisation of natural gas and electricity (for which natural gas is the main fuel) by domestic consumers.

9.1.3. Overview of Institutional Arrangements

The Energy Efficiency and Ecology Department represents an integral part of the MoEn, which is responsible for both the development and the implementation of energy efficiency policy. In practice, the Department is mainly focused on the development of regulatory acts and transposing the best international practice into the national legislative framework. At the same time, it lacks sufficient resources to implement the policies. The functions of the

Department are also limited by the specific rules and regulations of the state authorities, which constrain the Ministry's flexibility and available operational mechanisms. The effective implementation of energy efficiency policies requires sufficient human resources, both in terms of capacity and capability. It is therefore important that human resource needs for implementation be properly estimated and allocated to policy execution. In order to avoid a situation whereby policy development is favoured over policy implementation (as it is necessary to advance both in parallel), the budget for human resources dedicated to policy implementation should be separated from that of policy development.

It is crucial that public funds to support energy efficiency programmes and measures, which are often put in place for several years or more, come from stable revenue sources. Moreover, it is desirable that they not be subject to the annual budget-setting process of the civil service. The EE Fund currently envisaged under the draft Law on EE can be established to ensure a stable flow of funds to energy efficiency programmes and measures, so long as governance arrangements are appropriate, with high transparency regarding fund sources and spending.

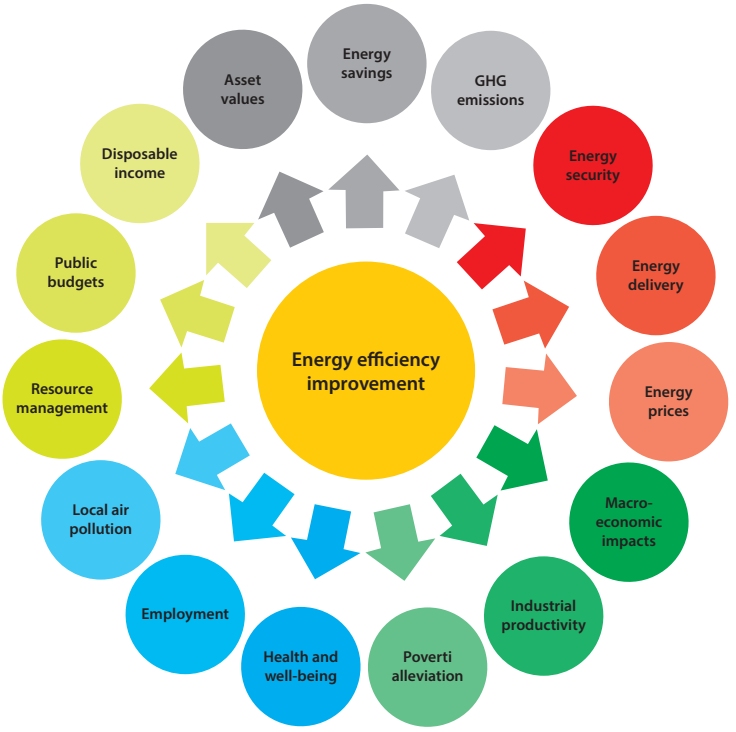
9.1.4. Multiple Benefits of Energy Efficiency

One of the main drivers behind the development and implementation of EE measures in Azerbaijan is increased revenue from the export of saved energy resources. However, the actual implementation of EE policies delivers investments and net benefits that are positive for the country's socioeconomic and sustainable development (as illustrated in Figure 29). It is therefore necessary to take strong interest in the level of ambition and impact of policies and measures. Estimating the costs and benefits of policies and measures in the policy development phase and evaluating them in the post-implementation phase are crucial to improving policy, obtaining stakeholder buy-in and ensuring successful energy efficiency policy for the long term.

Examples from around the world show that global leaders in both developed and developing countries are increasingly recognising the multiple benefits of energy efficiency and are introducing reforms to try to capture this value on a large scale. Such examples can be found in the United States, where the value of energy efficiency as firm capacity has been recognised,[108] in China, where the value of energy efficiency in improving air quality[109] has been recognised, and in the EU, where the aim of unlocking the multiple benefits of energy efficiency underpins the European Commission's proposals for EU energy sector reforms.[110]

108 R. Cowart, "Unlocking the Promise of the Energy Union: 'Efficiency First' is Key", December 2014, RAP, available at https://www.raponline.org/wp-content/uploads/2016/05/rap-cowart-efficiencyfirst-2014-dec-04.pdf (accessed June 2018).
109 IEA (2016), Energy Efficiency Market Report, available at https://www.iea.org/eemr16/files/medium-term-energy-efficiency-2016_WEB.PDF (accessed June 2018).
110 European Climate Foundation, Introduction by Maroš Šefčovič, European Commission Vice President for Energy Union, in "Efficiency First: A New Paradigm for the European Energy System", available at https://europeanclimate.org/wp-content/uploads/2016/06/ECF_Report_v9-screen-spreads.pdf (accessed June 2018).

Figure 29: The multiple benefits of energy efficiency improvements



Source: IEA Capturing the Multiple Benefits of Energy Efficiency, 2014

When developing energy efficiency policy, the European Commission assesses multiple benefits to some extent. For example, modelling for the EU's Clean Energy for All Europeans package[111] revealed that a binding EU-wide target of 30% for energy efficiency by 2030[112] compared to a less ambitious target of 27% would create an additional 70 billion euros and 400,000 jobs. Modelling underpinning the recent EU proposals to change the Energy Performance of Buildings Directive estimated that by 2030 the proposed changes should:

- Increase the market for insulation and flat glass by 23.8 billion euros;
- Create a building renovation market for SMEs with a value of between 80-120 billion euros;
- Generate other energy efficiency work in the construction sector to a value of around 47.6 billion euros.

A similar approach should be used by the MoEn of Azerbaijan to promote the adoption and the implementation of EE policy instruments and to enhance the awareness of decision makers and a wider population about the potential role of EE for achieving socioeconomic targets.

111 https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/clean-energy-all-europeans (accessed June 2019).
112 The proposed 30% target for 2030 translates into final energy consumption of 987 Mtoe and primary energy consumption of 1321 Mtoe in the EU, according to 2017 assessment of the progress made by member states towards the national energy efficiency targets for 2020, http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1511978095545&uri=COM:2017:687:FIN (accessed April 2019).

9.1.5. Main Barriers Identified

Summarising and drawing from the evidence presented in this chapter, the following key barriers to advancing energy efficiency improvements in Azerbaijan can be summarised as follows:

- There is literally no legislative framework on energy efficiency in the country;
- Before 2016, there was a lack of political willingness to implement reforms in the field of energy efficiency;
- There are no energy efficiency targets in the country;
- Energy tariff policy is not sustainable and does not create any incentives for the implementation of EE measures and wider strategic targets, like increased energy export;
- Non-cost-reflective energy tariffs and a lack of long-term energy tariff policy result in a vicious circle for consumers' acceptance of tariff increases;
- The Energy Efficiency and Ecology Department of the Ministry of Energy does not have sufficient human resources for the implementation of EE policies;
- There is generally a low level of awareness and limited knowledge about multiple benefits from the implementation of EE policy measures in Azerbaijan.

General Recommendations

1. Prioritise the development and approval of a long-term energy strategy. Such a strategy should include ambitious but realistic long-term quantitative targets and attainable objectives for EE and demand-side management. The strategy should also recognise EE as one of the priorities for meeting and reducing future energy demand, increasing energy export revenues and other benefits as a result of achieving long-term EE targets. In this framework, the strategy should also include the 'energy efficiency first' principle.
2. Prioritise the approval of the draft EE law and the timely adoption of the NEEAP and other legislative acts envisaged by the law. Continue ongoing efforts on the development of an energy-related legislative framework according to the Presidential Decree on "The Acceleration of Reforms in the Energy Sector of Azerbaijan".
3. Take action to improve the enforcement of planned energy efficiency policies and measures stipulated by the draft EE law, such as:
   - Define clear responsibilities and strengthen the coordination of EE policy development between different stakeholders;
   - Strengthen capacity and provide necessary resources to the authority responsible for the implementation of EE policy in the country. It might be advantageous to establish an entity on the basis of the existing Department of Energy Efficiency and Ecology of the Ministry of Energy or a new entity responsible for the implementation of EE policy under the Ministry. The possibility of separating the policy development, policy implementation and policy evaluation functions of the Department or a new entity under the Ministry should be analysed and assessed. An enforcement function should also be ensured;
   - Ensure effective feedback loops by improving coordination between the development, implementation and the evaluation of energy efficiency policy, energy sector strategy development and energy system planning. Develop internal communication rules in order to widely disseminate monitoring and evaluation results, including via the Internet;
   - The Energy Efficiency Fund, envisaged by the draft EE law, needs to be separated from the general state budget and ideally should be based on stable revenue streams e.g. tariff increases (public benefit charge), environmental taxes (e.g. transport fuels) or revenue received from exporting energy resources saved as a result of the implementation of EE measures. The EE Fund can also be appointed as the key authority for the implementation of EE policies, programmes and measures.
4. Establish a clear baseline, management information and benchmarking system in the EE field. This in-depth energy efficiency report can serve as a baseline for the monitoring and evaluation of future progress in implementing EE reforms.

5. Approve and implement new energy tariff methodologies supporting the efficient use of energy, including specific focus on the following provisions:
   - Clear incentive for energy utilities to reduce their operational costs;
   - Further improvement of the existing electricity tariff design in order to stimulate the efficient use of the existing electricity system, i.e. introduce prices depending on voltage and capacity, time-of-use pricing for all consumers, critical peak pricing, etc.
6. Enhance awareness of decision makers, civil servants and other stakeholders as to the multiple benefits that EE measures can bring to Azerbaijani society, i.e. the creation of new jobs, attracting new investments, increased exports, etc., using real evidence and case studies.

9.2. Energy

9.2.1. Sector Overview

The Azerbaijani electricity system is operated by three state-owned companies:

- Azerenerji OJSC, a vertically integrated enterprise in charge of generation and transmission for the whole country, except Nakhchivan AR;
- Azerishig OJSC, responsible for distribution and supply for the whole country, except Nakhchivan AR;
- State Energy Service, a vertically integrated enterprise in charge of generation, transmission, distribution and supply in Nakhchivan AR (see Section 3.1).

During 2008–2017, the country increased the installed capacity of its thermal power plants (TPPs) by 42% and hydro plants by 8%, creating significant potential for electricity export. Indeed, according to the Action Plan of the "Strategic Road Map on Public Utilities", the GoA set a specific target to provide 50% of Georgia's and 20% of Turkey's electricity imports until 2020 (see Section 5.3). The electricity export varied from 2% of total generation in 2009 to 5.3% in 2017. Natural gas was the main source of electricity generation and the share of thermal power generation fluctuated from 82% to 94% over the last decade. In 2017, 92% of electricity was produced from natural gas 7% from hydro and about 1% from waste, wind and solar.

SOCAR is a state-owned monopoly that operates the natural gas sector of Azerbaijan. The natural gas transmission, storage, distribution and supply functions of SOCAR are assigned to its daughter company Azerigaz PU (see Section 3.2). During 2008–2017, natural gas production increased by 11.7% and the export of natural gas increased by 68.9%. In 2017, SOCAR produced 18.2 bcm of natural gas, 48.7% of which was exported. In the same year, the company had to import about two bcm of natural gas to cover the demand on the internal market and to fulfil its export contractual obligations. Natural gas export is an important revenue source for the country and the development of the Shah Deniz Stage 2 project together with the construction of the Southern Gas Corridor can potentially triple the exporting capacities of the country.

The Azerbaijani heat sector is represented by a single state-owned company Azeristiliktechizat OJSC, which operates in 51 of the country's 63 administrative regions. At the same time, some newly built multi-apartment houses have their own boiler-houses that do not belong to Azeristiliktechizat and are therefore not reflected in heat balances (see Section 3.3.). In 2017, total heat generation was 1,572,000 Gcal (0.16 Mtoe), which was almost the same level as in 2008. However, there were significant changes in the production and consumption patterns of heat over the same period. During 2008–2017 the share of energy industry and non-energy heat demand fell from 38% and 28%, respectively, to almost zero, while consumption by households increased almost fourfold. The share of heat generated by CHP decreased from 64% to 9% over the same period. In 2017, 99.8% of heat energy was produced from natural gas and 0.2% from diesel and other oil products.

9.2.2. Assessment of Existing Energy Efficiency Potential

Three key studies have estimated the energy efficiency potential of the country's power and heat sector:

- Energy Efficiency Orbits for Transition Economies, developed by the Center for Energy Efficiency (CENEf) and the Copenhagen Centre on Energy Efficiency (C2E2) in 2015;

- Diagnostic Assignment Aimed at Increasing the Efficiency of Power Stations Owned by Azerenerji, requested by the Cabinet of Ministers and developed by VPC GmbH in 2016;
- Optimisation and Rehabilitation Programme of Power Generation Facilities of JSC Azerenerji, requested by the Ministry of Energy and developed by ENERCO Engineering & Consulting GmbH in 2018.

The CENEf's estimate of the country's technical energy efficiency potential for power and heat was 1.678 Mtce (equivalent of 1.175 Mtoe),[113] or about 38% of energy used for transformation to electricity and heat in 2013. Table 12 provides a breakdown of the CENEF's estimates, based on global practice. The CENEf remarks, however, that the data provided are subject to many assumptions and should be used primarily for indicative purposes

Table 12: Energy efficiency potential in power and heat industry (as of 2013)

Integrated technologies of goods, work, and services production	Units	Volume of economic activity	Units	Specific consumption in 2013	Practical minimum	Actual consumption abroad	Comments	Estimated technical potential, 1000 tce
Gas-fired district power plants (GRES) retrofits	mln kWh	14,870	gce/ kWh	226	205	262	CCPP with 60% efficiency	311
Gas-fired co-generation plants (TETs) retrofits	mln kWh	8,472	gce/ kWh	325	205	262	CCPP with 60% efficiency	1,016
Own needs consumption	mln kWh	23,350	%	6.9%	4.0%	5.0%	North America	83
Electricity transmission	mln kWh	19,701	%	16.6%	6.9%	7.0%	Japan	236.0
Gas-fired boilers retrofits	thou. Gcal	1,022	kgce/ Gcal	167	151		Equipment with 95% efficiency	16.4
Electricity consumption for heat generation by boilers	thou. Gcal	1,022	kWh/ Gcal	23	7	9	Finland	2.0
Heat distribution	thou. Gcal	1,122	%	14.2%	5.4%		Replacement of heat pipes (new technology)	14.1
Total for power and heat								1,678

Source: CENEf as quoted in C2E2, 2015

Based on an analysis of the CENEf's findings, retrofitting and substituting conventional thermal power plants (TPP) with combined-cycle power plants (CCPP) should be considered as a key priority for the power sector. The study also identifies significant potential for a reduction in electricity losses, which is also one of the key targets of the Strategic Road Map on Public Utilities (see Chapter 5.3).

113 Energy Efficiency Orbits for Transition Economies, Center for Energy Efficiency (CENEf), Copenhagen Centre on Energy Efficiency (C2E2), available at http://www.cenef.ru/file/Final%20Report_C2E2_CENEf_June2_2015.pdf (accessed July 2019).

The results of the VPC study revealed the following areas for improvement:

- Most of the power units are operated in a part load mode, using only 50-90% of the design/guaranteed power output. The part load operation leads to a reduction in plant efficiency (increasing specific fuel consumption) as well as an increase in specific maintenance costs. Improving the availability and load factor will enhance the capacity utilisation of the base load of the plants by up to 80-85%. These measures will facilitate significant fuel savings of up to 10%;
- The environmental aspects of power generation are handled very negligently. No power plant is equipped with an emission monitoring system, except Sumgayit CCPP. Emission values have not been included in the performance guaranteed indicators[114] and are not properly controlled either during operation or in the course of maintenance works.

At the same time, the VPC study confirmed that the level of technical losses in the Azerbaijani transmission system is comparable to Western grid operators based on the benchmark analysis conducted. The goal of the VPC study was to establish a further programme of optimisation, rehabilitation and efficiency increase of the existing power plants. Optimisation of the energy system mode based on the effective use of modern manoeuvrable gas turbine power plants is of great importance in improving the efficiency and dynamic sustainability of the country's energy supply. Indeed, maximum use of the obsolete conventional power plant, which was not particularly necessary, was one of the reasons leading to a systemic accident on 8 July 2018.

In order to prevent such emergencies and to ensure the effective functioning of the energy system, the Ministry of Energy in collaboration with ENERCO Engineering & Consulting GmbH developed the project "Optimisation & Rehabilitation Programme Power Generation Facilities of JSC" Azerenerji" in 2018. This project deepened the analysis initiated in the VPC study with the aim of increasing the efficiency and the reliability of Azerbaijan's power sector. One of the key recommendations of the ENERCO study was to continue the roll-out of the SCADA system, which currently covers 45 power facilities.

Further assessment of energy efficiency potential in the power sector is estimated based on the following key performance indicators according to best international practice:

- Capacity utilisation factor;
- Unit/block/plant output vs. design value (guaranteed value);
- Plant efficiency (fuel utilisation, heat rate or specific fuel consumption);
- Auxiliary consumption;
- Electricity and heat-specific production costs;
- Environmental values;
- Electricity own use;
- Network losses in transmission and distribution networks;

Capacity utilisation factor

The capacity utilisation factor (or capacity factor) is a ratio between the electricity produced in a given period by a power plant to the maximum possible electricity amount that can be produced with the installed capacity, i.e. installed capacity multiplied by annual hours (8,760 hours). This indicator is not merely attributed to plant conditions, but also to

114 Performance guaranteed indicators are defined during the commissioning of equipment by start-up tests. They include technical, technological and environmental indicators, such as power, energy, fuel consumption, emissions and others.

the plant's operation mode. The capacity factor is defined for any electricity-producing installation, such as a fuel-consuming power plant. The capacity factor is often computed over a timescale of a year, averaging out most temporal fluctuations.

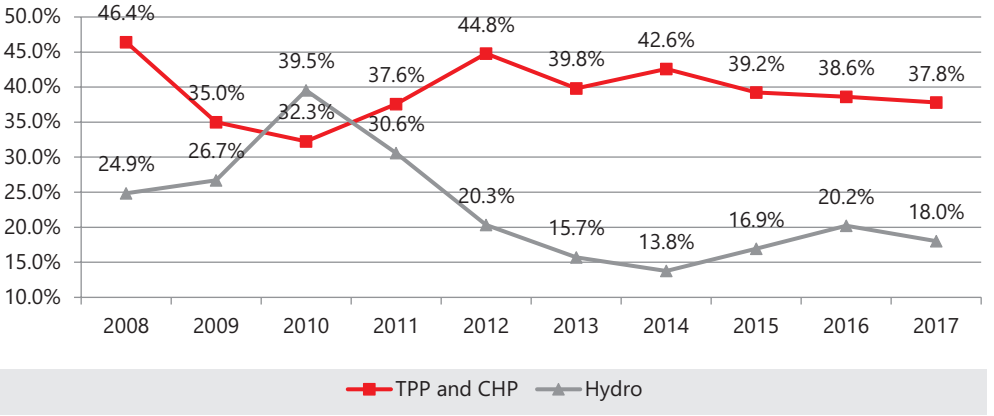
The technical conditions of power plants in Azerbaijan are characterised by the fact that all power plants are in operation and provide reliable power supply to the national grid. The dispatcher determines the wearable power of all power plants. At the same time, modern methods for optimising the operating mode of the energy system are not effectively used.

The availability of a large number of generating capacities and the lack of regulatory framework on the dispatch control and the optimal regimes of the power system led to the large scale overrun of the use of primary energy resources, as also noted in the SRM on public utilities development.

The data of the SSC additionally show that the installation of new generating capacities did not coincide with the dynamics of electricity production and export over the last decade. For example, a 42% increase in TPP and CHP capacities resulted in only an 15% increase in generation by these plants. As for hydropower, despite an 8% increase in installed hydro capacities, electricity production by HPP decreased by 22% during 2008–2017. The deeper analysis of the average capacity utilisation factor of power plants also indicates that the highest capacity utilisation factor of TPP and CHP plants was 46.4% in 2008, at the beginning of the analysed period (Figure 30). This low value of the capacity utilisation factor of TPP is the result of the dispatcher's inefficient management of the energy system. It should also be noted that some generators have technical limitations, especially Baku CHP.

The low level of the capacity factor of hydropower plants is mainly related to seasonal conditions and to the level of water in rivers and irrigation regimes. However, in 2017 the capacity factor for hydro plants was significantly lower than at the beginning of the analysed period.

Figure 30: Capacity utilisation factor of installed generating capacities, 2008–2017, %



Source: State Statistics Committee, 2019

Whereas Figure 30 presents the average capacity utilisation factor for the whole country, Annex 2 provides specific indicators per plant belonging to Azerenerji. Indeed, Annex 2 illustrates that the average utilisation of TPP plants decreased from 47% in 2014 to 45%

in 2017, while the capacity utilisation factor of CCPP fluctuated from 56% to 71% during 2014–2017. This confirms the fact that modern high-tech power plants with a high degree of efficiency are less loaded than the nominal capacity and are used at an ineffective level. As a result, more fuel and electricity (including for own use) are consumed by power plants. There is also no merit order or clear methodology as to the optimal capacity distribution among power plants in Azerbaijan.

The deeper analysis also shows that increasing the average capacity utilisation factor of TPP and CHP plants by 1 percentage point (pp) can provide savings at the level of 56 mcm of natural gas or 134,500 tonnes of CO_2. Moreover, the Action Plan of the "Strategic Road Map on Public Utilities" clearly stipulates that all natural gas saved as a result of increased efficiency in the power sector should be exported (see Section 5.3). Therefore, the improvement of the capacity utilisation factor by 1pp can additionally contribute 8.9M USD to the state budget. Thus, the improvement of the capacity utilisation factor to the level of 2008 (i.e. 46.4%) can potentially save 1,157,000 tonnes of CO_2 emissions and additionally bring 76.3M USD to the GDP of the country (see Table 13 below).

It should also be mentioned that the exploitation of physically and morally obsolete power plants is still under way. Furthermore, the exploitation of obsolete power plants is one of the reasons for systemic accidents that resulted in considerable damage to the energy sector and the country's economy. The most severe systemic accident occurred due to the poor technical condition of the conventional thermal power plant Azerbaijan TPP on 8 July 2018.[115]

Unit/block/plant output vs. design value

This indicator specifies how close the current plant output is to the design or guaranteed values. The operation of plants in part load (whether due to plant equipment or dispatcher limitations) reduces plant efficiency (especially for CCPP and CHP plants) and leads to higher maintenance expenses, as they are calculated based on operating hours that are counted independently from the load.

Unfortunately, there is no publicly available information on the correlation between existing plants' output and design value. At the same time, the SSC provides sufficient information for the calculation of average plant efficiency.

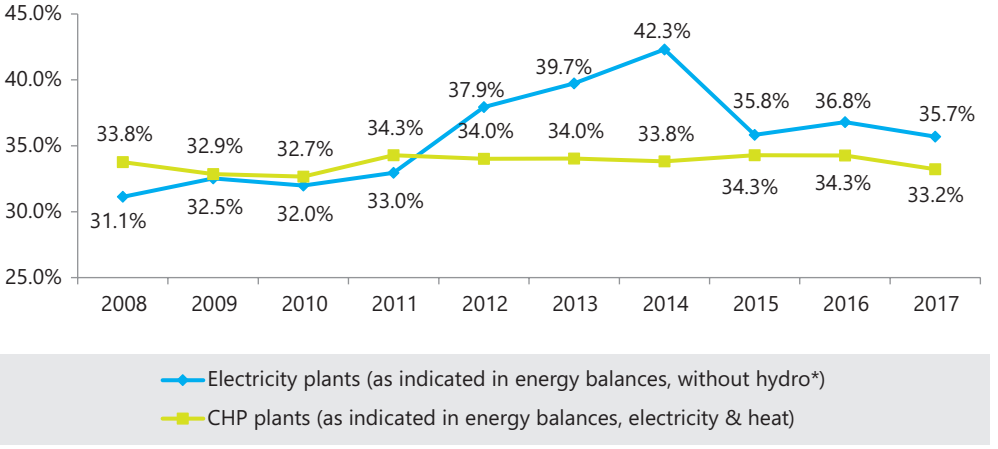
Plant efficiency (fuel utilisation, heat rate or specific fuel consumption)

Plant efficiency is one of the major indicators. Efficiency is counted as a ratio between the electrical energy output and the energy input of the fuel (based on the lower heating value of fuel) utilised for the production of this amount of electrical energy.

According to the annual energy balances published by the SSC, average electricity plant efficiency increased from 31.1% in 2008 to 42.3% in 2014 and dropped to 35.7% in 2017. The efficiency of the CHP plants plateaued at the level of 33%-34% during the whole analysed period and was 33.2% in 2017 (Figure 31).

115 Azerbaijan's Country-wide Electricity Blackout: Problems, Causes, and Results, CESD, 2018, Available at http://cesd.az/new/wp-content/uploads/2018/07/CESD_Energy_Paper.pdf (accessed August 2019).

Figure 31: Average plant efficiency (terminology as in energy balances), 2008–2017, %



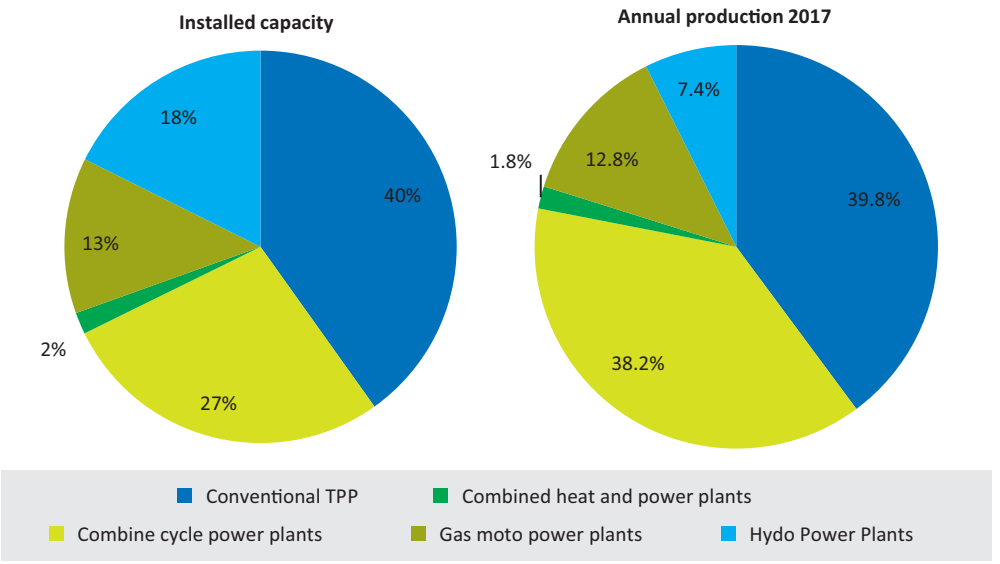
** AZ energy balance indicator "electricity plants" includes generation from hydro, therefore it was manually deducted for the purpose of this calculation*

Source: State Statistics Committee, 2019

It should also be highlighted that the data published by the SSC do not comply with the information provided by Azerenerji and MoEn. Indeed, Table 2 shows that there is only one CHP in Azerbaijan with a total installed capacity of 107 MW or 1.5% of the total installed capacity (see Section 3.1.), whereas the SSC's official energy balances shows that CHPs produced between 32% and 49% of the total electricity generated. Another important aspect is that the "electricity plants" indicator does not separate electricity produced from hydro and therefore it was manually deducted for the purpose of the calculation presented in Figure 31. It is also impossible to calculate the average plant efficiency based on the generation technology used (e.g. conventional TPP, CHP, CCPP) through publicly available data.

Figure 31 additionally indicates that despite significant investments in new modern generating capacities, improvements in average plant efficiency were insignificant. For example, Figure 32 shows that CCPPs represented 27% of the total capacity of Azerenerji and produced 38% of the company's electricity production in 2017. Thus, the efficient utilisation of available CCPP capacities with designed efficiency of up to 62% should have stimulated significant improvements in average thermal power plant efficiency in Azerbaijan, yet Figure 31 indicates the opposite. This once again confirms the fact that that modern high-tech power plants with a high degree of efficiency have been less loaded than nominal capacity and have been used ineffectively.

Figure 32: Azerenerji's installed capacity and production in 2017, %



Source: Ministry of Energy, 2019

The deeper analysis also shows that improving the average system plant efficiency by 1pp can provide savings at the level of 174 mcm of natural gas, or 418,500 tonnes of CO_2. Moreover, the Action Plan of the "Strategic Road Map on Public Utilities" clearly stipulates that all natural gas saved as a result of increased efficiency in the power sector should be exported (see Section 5.3). Therefore, the improvement of the average plant efficiency by 1pp can also contribute 27.6M USD to the state budget. Thus, the improvement of the average plant efficiency to 2014 level (42.3%) can potentially save 2,762,000 tonnes of CO_2 and additionally bring 182.1M USD to the GDP of the country (see Table 13 below).

Auxiliary Consumption

Auxiliary consumption is an important power plant indicator, which is partly considered by the plant net efficiency (plant net specific fuel consumption). Despite the fact that auxiliary consumption is particular to each plant and relies on site and project specifics, it is important to compare operation figures with a benchmark and computer simulations to assess its level. However, there is no publicly available information on auxiliary consumption.

Electricity and Heat-specific Production Costs

Electricity and heat-specific production costs are a major indicator of plant economic efficiency, but there is no publicly available information on these.

Environmental values

Environmental values or actual emissions are important indicators of plant operation, but there is no publicly available information on these in Azerbaijan.

Electricity Own Use

According to the information provided by the SCC, energy sector own use includes own electricity consumption by power plants, oil and gas sector extraction, refining and processing enterprises.

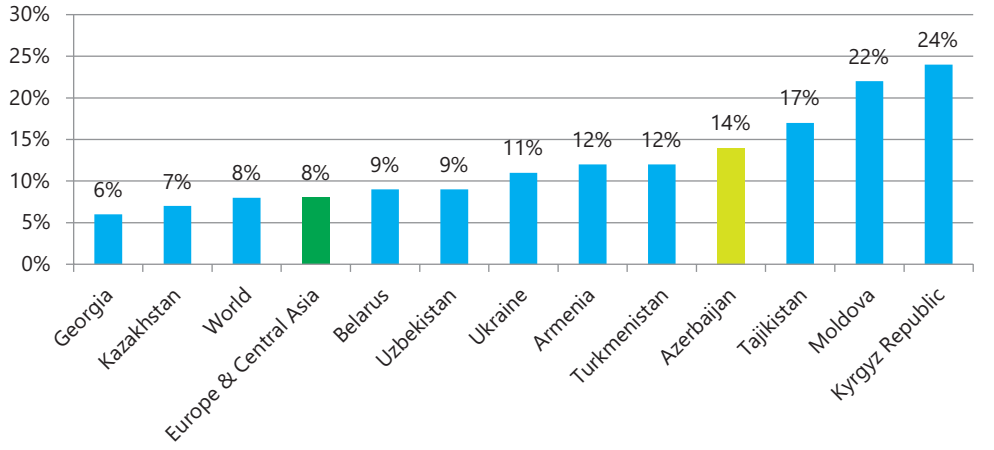
However, the SCC only provides total figures on energy sector own use, without any additional breakdown per sub-sectors. For example, Figure 24 shows that the electricity consumption of energy industry own use grew from 10.4% of the input to the transmission network operator in 2008 to 16.3% in 2017. However without a breakdown of energy sector own use into sub-indicators, it is not possible to determine which sub-sectors influenced the increase identified.

It should also be mentioned that information on power plants' own use is collected separately by the MoEn, but it is not publicly available. According to the information provided by the Ministry, there was only an insignificant decrease in power plants' own use during 2010–2017 (i.e. from 3.3% of the generated electricity in 2010 to 3.2% in 2017). Therefore, more detailed analysis about energy industries' own use is needed to estimate the energy efficiency potential.

Electricity Losses in Transmission and Distribution Networks

The dynamics of electricity losses in TSO and DSO networks are provided in Figure 24. Despite the results achieved in reducing losses over the last decade, electricity losses in Azerbaijan are significantly higher than the average indicators for the world, Europe and Central Asia. According to the World Bank's (WB) data, Azerbaijan's losses in 2014 were almost 70% higher than average losses globally as well as in Europe and Central Asia more specifically, although they were still considerably lower compared to some other countries in the region (Figure 33).

Figure 33: Transmission and distribution losses in 2014, % of output



Source: WB, World Development Indicators[116], 2019

116 http://wdi.worldbank.org/table/5.11# (accessed August 2019).

Indeed, the analysis provided in Chapter 4.1 indicates the significant reduction of losses in Azerbaijan since 2014. According to the WB's methodology, the total level of TSO and DSO losses in 2017 was around 10% of the output. Therefore, the reduction of electricity losses to the average level in Europe and Central Asia (8%) can provide savings at the level of 121 mcm of natural gas or 291,000 tonnes of CO_2. Moreover, the Action Plan of the "Strategic Road Map on Public Utilities" clearly stipulates that all natural gas saved as a result of increased efficiency in the power sector should be exported (see Section 5.3). Therefore, the reduction of the losses by 2pp can also contribute 19.2M USD to the state budget. The reduction of the losses to the level of neighbouring Georgia can potentially bring 38.4M USD to the GDP of the country. The result of the overall analysis on the environmental and economic impacts of the reduction of energy losses and the improvement of the efficiency of generating plants is presented in Table 13.

Table 13: Potential annual savings from the implementation of EE measures in energy sector

Measures	Natural gas savings, mcm	CO_2 emissions reduction, $MtCO_2$	Average export price in 2017, USD/ thsd. cubic m	Savings, M USD
Improvement of the capacity utilisation factor by 8pp (the level of year 2008)	481.9	1.157	158	76.3
Improvement of the average plant efficiency by 6pp (the level of year 2014)	1,150.8	2.762	158	182.1
Reduction of electricity losses to the average level of neighbouring Georgia (6%)	242.6	0.582	158	38.4
Reduction of natural gas losses by 1pp (6.1%)	108.7	0.261	158	17.2
Reduction of heat losses by 3.5pp (the level of year 2008)	6.0	0.014	158	0.9
Total	**1,990**	**4.776**	**158**	**314.9**

Source: Energy Charter Secretariat, 2019

The results of the analysis presented in Table 13 indicate that the total potential annual savings from the implementation of EE measures in the energy sector can help the country to achieve about 4.8 $MtCO_2$ or more than half of the remaining 8.6 $MtCO_2$ reduction required to meet the official 2030 INDC target of Azerbaijan (see Table 9). The total value of potential energy savings in the energy sector is about 314.9M USD.

Table 13 also shows that the potential natural gas savings from the implementation of energy efficiency measures in the energy sector are equal to almost two bcm per year. At the same time, the natural gas import in 2017 was also at the level of two bcm (see Figure 18). Thus, the implementation of energy efficiency measures in the energy sector may not only bring ecological and financial benefits for the country, but could completely eliminate the need for natural gas import in 2016 and 2017.

9.2.3. Existing Policies and Implementations

Approval of Specific Fuel Consumption and Own Electricity Use of Power Plants

Every year, the Cabinet of Ministers approves the level of specific fuel consumption and own electricity use of power plants as well as the level of losses in network systems. These levels are based on the fuel and energy balance developed by the Ministry of Energy according to specific methodologies that are not publicly available. However, in many cases, the actual level of specific fuel consumption and own electricity use by power plants does not reflect the real potential for energy efficiency and rational energy use. Best world practice shows that the highest efficiency of power plants can be achieved by the introduction of an effective merit order and developing a regulatory framework that incentivises optimal capacity distribution among power plants in Azerbaijan in order to ensure the most reliable and efficient balance of electricity demand and supply.

Competition in the Electricity Generation Market

Complete and fair electricity market rules and price formation constitute the most cost-effective way to improve the efficiency of the electricity generation market, i.e. an inefficient and obsolete power plant with high production costs and GHG emissions should only operate when there is a significant shortage of more efficient production capacities.

Currently, Azerbaijan's electricity and gas markets have vertically integrated monopoly forms and are subject to the state. In addition, natural monopolies are not separated from competitive market activities. In the electric energy sector, generation is not separated from transmission and is managed by Azerenerji. Furthermore, the distribution functions of Azerishig are not separated from supply. The gas sector is managed by SOCAR in the form of a production unit. So far no practical steps have been taken to liberalise the markets of these sectors (see Chapter 3 for more details).

However, the Ministry of Energy is actively working to create a legislative framework. Projects under development include Electricity Law, Electricity Market Law, Law on the Regulator, Law on Energy Efficiency, Cogeneration Law and Renewable Energy Law and network codes for the transmission and distribution of electrical energy. Draft laws on energy efficiency, electricity and the electricity market are currently under consideration by the Presidential Administration.

Promotion of High-efficient Cogeneration

Cogeneration plants can achieve energy efficiency levels of around 90% and represent one of the most efficient and environmentally friendly ways of simultaneously producing electricity and heat energy. For example, increased cogeneration could lower GHG emissions by up to 250 million tonnes in the EU by 2020 and therefore an EU Energy Efficiency Directive (EED) stipulates conducting cost-benefit analysis of the potential for using cogeneration when planning to build or substantially refurbish the following units:[117]

- A heat or electrical installation with a total thermal input exceeding 20MW;
- An industrial installation generating waste heat with a total thermal input exceeding 20MW;
- A district heating and cooling network exceeding a total thermal input of 20MW.

117 Promoting cogeneration in Europe Available at https://ec.europa.eu/energy/en/topics/energy-efficiency/cogeneration-heat-and-power (accessed August 2019).

As of September 2019, there are no incentives or obligations to use high-efficiency cogeneration in Azerbaijan. It should also be noted that the provisions on obligatory cost-benefit analysis for using cogeneration in Azerbaijan were included in the draft Law on EE developed by the EU4Energy, but were rejected during the inter-ministerial consultation process.

Reduction of Losses in the Network

The 2020 targets on the reduction of losses in network operators are approved by the Action Plan of the Strategic Road Map on Public Utilities and exist only for electricity and natural gas networks (see Chapter 5.3). However, there are no targets for heat networks or for electricity and gas beyond 2020, or relevant studies on the cost-effective potential for loss reductions in utilities.

Improvement of the Cost-effectiveness of Public Utilities

There are no specific regulatory incentives to reduce operational costs or to improve the cost-efficiency of natural monopolists in Azerbaijan. On the contrary, the "cost plus" tariff methodology provides the wrong incentives for utilities to increase their costs in order to justify the higher need for the regulated revenue. At the same time, it should be mentioned that the draft Methodology of Electricity Tariff Calculation developed within the ADB TA includes an X-factor targeting improvements in the cost-effectiveness of electricity network operators.[118]

The subsidies and lack of transparent methodology for the determination of the revenue of natural monopolists also negatively affects the cost-effectiveness of public utilities. This statement is supported by the Center for Economic & Social Development,[119] indicating high operational losses of utilities resulting in significant losses in financial reports that are usually covered by the state budget. For example, there is a subsidy fund for the purpose of covering the loss created by SOCAR selling gas to Azerenerji OJSC below market value (176.5M USD or 300M AZN in 2017).[120] The analysis presented in Chapter 9.1 also indicates that direct subsidies to electricity, natural gas and heat consumers exceeded 3.2 bn. USD during 2015–2017 (see Table 11).

Power Network Planning, Capacity and Demand-side Management (DSM)

According to the information provided by the MoEn, the power demand of the Unified Energy System of Azerbaijan (without Nakhichevan AR) during peak hours was about 3,700 MW in 2017. Installed generating capacity in the mainland of the country was about 6,800 MW (see Chapter 3.1). Therefore, the difference between the installed capacity and the peak load was 3,100 MW or almost 46% of installed total capacity. This is a very large reserve for ensuring the security of the country's energy supply and export of electric energy. The inefficient operation of such excess capacity identified in the VPC study significantly increases costs for the production of electricity as well as reduces the efficiency and reliability of the energy system. Thus, the most important task is the effective use of the excess capacity of power plants of the country.

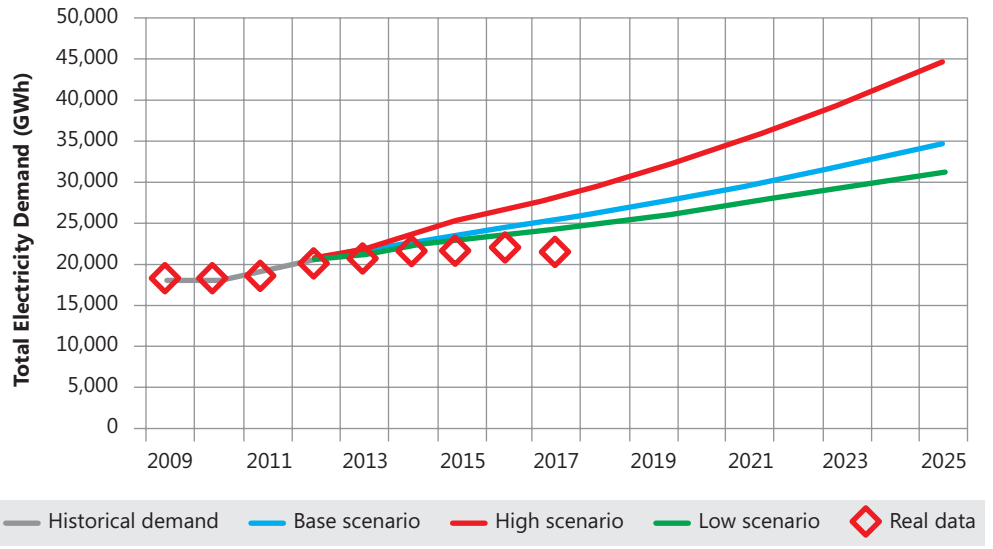
118 According to the information provided by the AERA during the peer review mission to Baku on 16-18 September 2019 (see Annex 5).

119 Azerbaijan's Country-wide Electricity Blackout: Problems, Causes, and Results, CESD, 2018, Available at http://cesd.az/new/wp-content/uploads/2018/07/CESD_Energy_Paper.pdf (accessed August 2019).

120 http://sai.gov.az/upload/files/2018-DURUSTLESME-REY-FINAL.pdf (accessed August 2019).

The deeper analysis of the correlation between installed capacity and production indicates that the development of energy capacities was not sufficiently coordinated with the growth of the country's economy and estimated consumption growth. Indeed, the Power Sector Master Plan of Azerbaijan 2013–2025, updated by Fichtner Consultants based on the request of Azerenerji in 2013,[121] was overly optimistic and was not updated despite the significant difference between forecasts and actual consumption over the last five years. Therefore, the actual development of new generating capacities took into account this exaggerated forecast. Figures 34 and 35 show the discrepancy between actual consumption during 2013–2017 and three forecast scenarios: base, high and low.

Figure 34: Annual electricity demand, Forecast Fichtner, 2013 vs. real data 2014–2017

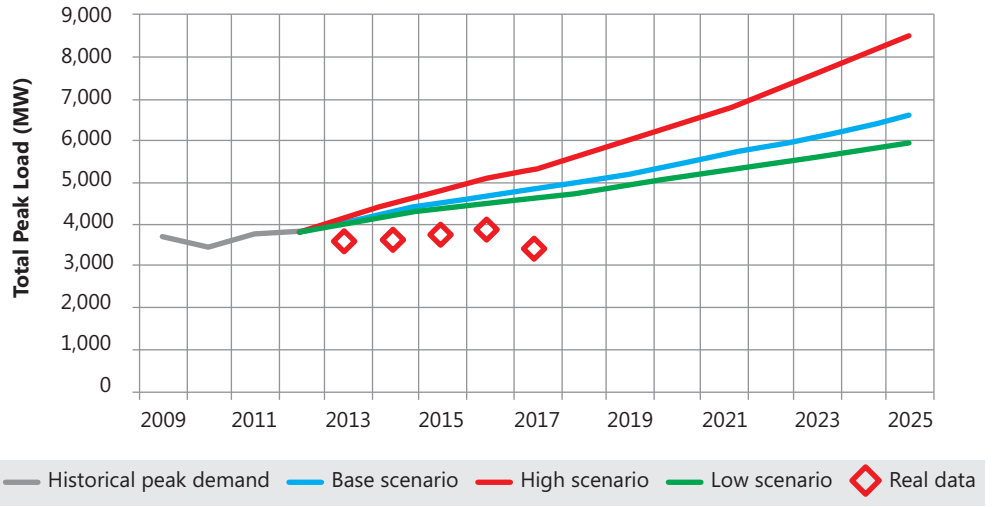


Source: SSC, 2019, Update of the Power Sector Master Plan of Azerbaijan, Fichtner, 2013

As can be seen from Figures 34 and 35, the actual consumption of electrical energy and peak load demand in 2014–2017 was significantly lower than even the 'low scenario' estimated in 2013.

121 http://www.inogate.org/documents/3_FICHT-11527706-v2-Final_Report_Azerbaijan.pdf (accessed August 2019).

Figure 35: Peak load demand, Forecast Fichtner, 2013 vs. real data 2014–2017



Source: SSC, 2019, Update of the Power Sector Master Plan of Azerbaijan, Fichtner, 2013

Another important aspect is that the decisions made on the development of the power system were based on supply-side options and did not take into account demand-side measures. In fact, demand-side measures deserve to be evaluated routinely against supply-side options in network planning and resource adequacy or reliability assessment processes. In many jurisdictions around the world, utilities are required to seek out the least expensive options for developing and investing in the energy system, with full consideration of energy efficiency investment opportunities and of various benefits, including system reliability, reduced greenhouse gas emissions and positive economic impacts.

Currently, there are no regulatory incentives or programmes for DSM in Azerbaijan. There is also no methodology for the calculation of auxiliary services to be provided by big consumers.

9.2.4. Main Barriers Identified

Summarising the key findings and conclusions of this chapter, the following main barriers have been identified:

- Strategic decisions on the development of the power system are based on supply-side options and do not take into account demand-side measures;
- The construction of new generating capacities did not coincide with the dynamics of electricity production, peak demand and export over the last decade. There is a lack of coordination between the development, implementation and evaluation of energy efficiency policy, energy sector strategy development and energy system planning;
- A lack of market rules on competition negatively influences the efficiency of the electricity generation market. There is also no clear merit order or methodology on the optimal capacity distribution among power plants and ancillary services in Azerbaijan;

- There is a lack of publicly available data on the key performance indicators (KPIs) of power generating sector;
- There are no incentives for improving overall plant efficiency and reducing fuel consumption by generating plants. Modern CCPP power plants with high efficiency are loaded below their nominal capacity, leading to a decrease in their efficiency;
- The wide exploitation of obsolete power plants has been one of the reasons for accidents in the power sector;
- There are no policies promoting high-efficient cogeneration. In fact, the heat output of the CHP to the DH sector decreased from 64% to 9% of the total input to the DH network;
- The terminology used by the SSC in energy balances is incorrect and does not comply with the information provided by Azerenerji and MoEn; SCC only provides total figures on energy sector own use, without any additional breakdown per sub-sectors;
- There are no targets for heat networks, no targets for electricity and gas beyond 2020 and no relevant studies on the cost-effective potential for loss reduction in utilities;
- There are no incentives for public utilities to reduce their operational costs.

Recommendations: Energy Sector

7. Conduct further reforms supporting functional unbundling and the development of electricity market, taking into consideration EE. Introduce competition in the electricity generation market and develop an efficient regulatory framework, incentivising optimal capacity distribution among power plants in Azerbaijan in order to ensure the most reliable and efficient balance of electricity demand and supply.
8. Prioritise the reduction of specific fuel consumption and power plants' own use. Introduce incentives for the management and the staff of the plant to improve overall plant efficiency and reduce fuel consumption. Increase transparency and regularly publish data on key performance indicators of the power-generating sector (see Recommendation 13).
9. Introduce specific long-term targets aimed at improving the efficiency of energy transformation, the reduction of losses in electricity, natural gas and heat networks.
10. Develop and approve a methodology for ancillary services. Network operators can be required to encourage demand side, like aluminium and other heavy industry plants, to participate in ancillary service market.
11. Adopt policy measures to promote a wider application of high-efficient cogeneration and/or efficient district heating and cooling systems. Conduct cost-benefit analysis for the application of high-efficient cogeneration for installing new or refurbishing existing electricity generating units with a total thermal input exceeding 20 MW.
12. Initiate the development of a heat map that should include existing district heating capacities and waste heat from industry and power generation sector. Use the heat map for the planning and development of district heating/cooling systems and the efficient utilisation of waste heat.
13. Maintain efforts to improve national energy statistics, including the following:
    - Improve the availability of statistics on natural gas losses with regard to the separation of transmission and distribution losses;
    - Improve the availability of detailed statistical information on the energy sector's own use, dividing this indicator into own use of the power plants (as one of the main energy saving indicators of power plants) and final consumption by energy industry sub-sectors;
    - Introduce new statistical information on key performance indicators of power-generating plants;
    - Align electricity balance terminology with best international practices (i.e. the use of correct terminology for combined cycle power plants (CCPPs), thermal power plant (TPPs) and combined heat and power plants (CHPs) in energy balances);
    - Expand recently introduced EE indicators to all sectors of the economy and add indicators based on physical outputs per sector.

9.3. Industry

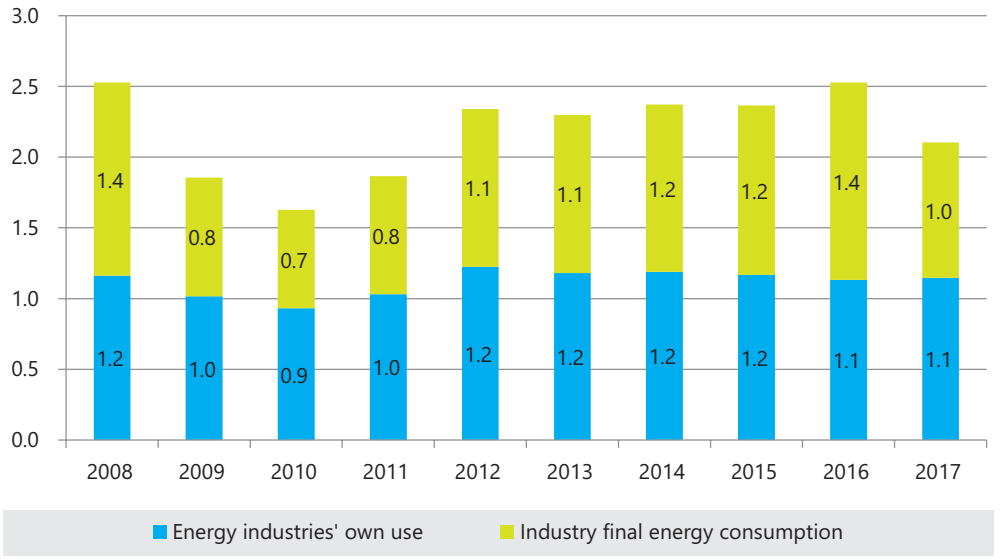
9.3.1. Sector Overview and Consumption

According the SSC, the industry sector of the Republic of Azerbaijan includes the following sub-sectors:

1. Mining industry (including oil and gas extraction);
2. Manufacturing (including oil refining);
3. Electricity, gas and steam production, distribution and supply;
4. Water supply, waste treatment and disposal.

Figure 5 (see Chapter 1.2 for more details) shows that industry was the main GDP-generating sector of the country at 40.1%, including mining (34.2%), manufacturing (4.7%), power (1%) and water (0.2%) in 2017. At the same time, the SCC uses different methodologies for calculating the GDP and the energy consumption of the industrial sector, dividing the industry's consumption into total final energy consumption by non-energy industry and energy industries' own use (Figure 36).

Figure 36: Final energy consumption by non-energy industry and energy industries' own use, 2008–2017, Mtoe

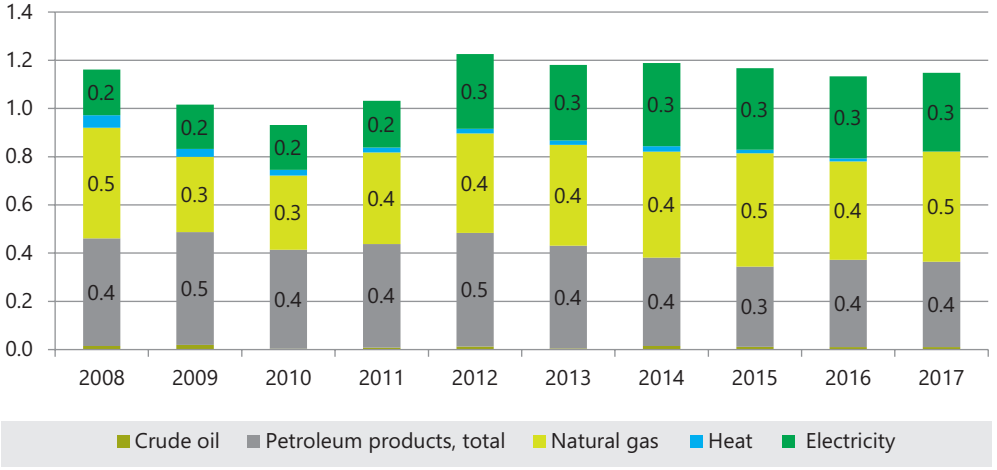


Source: State Statistics Committee, 2019

Figure 36 shows that total consumption by the industrial sector was at its highest level of 2.5 Mtoe in 2008 at the beginning of the analysed period, dropped by 36% during 2008–2010, gradually returned to the previous maximum level in 2016 and again dropped by 17% in 2017. The share of energy industry consumption was 55%, but the energy-related sub-sectors contributed 81% to the GDP generated by industry in 2017. This can be explained by the fact that energy industries' own use includes oil and gas extraction, processing, oil

refining, electricity and gas transportation as well as electricity generation plants' own use. However, the SSC does not provide a breakdown of energy industries' own use by sub-sectors, only by fuels (Figure 37).

Figure 37: Energy industries' own use by fuel type, 2008–2017, Mtoe



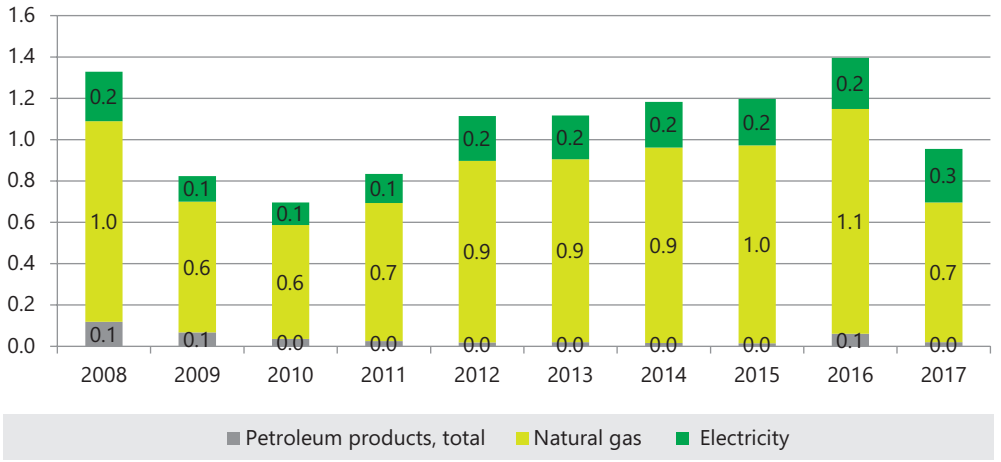
Source: State Statistics Committee, 2019

The deeper analysis of energy industries' own use indicates that despite the reduction in natural gas consumption during 2009–2011, the total volume of gas consumption remained unchanged over the last decade. Other fuels followed different patterns:

- The consumption of petroleum products fluctuated at the level of 0.41-0.47 Mtoe during 2008–2013 and dropped by 20% to the level of 0.33-0.37 Mtoe during 2014–2017;
- The consumption of electricity increased by 72% over the analysed period and reached the level of 0.33 Mtoe in 2017;
- The consumption of heat decreased from 0.05 Mtoe in 2007 to almost zero in 2017.

Final energy consumption by non-energy industries exhibited a different pattern over the same period of time. Total non-energy industrial consumption dropped by 50% during 2009–2010, gradually increased by 67% during 2011–2016 and again dropped by 32% in 2017 (Figure 38). The consumption of electricity and natural gas was relatively stable, except for in 2009–2011 when it decreased by 30-50%. The consumption of petroleum products was insignificant during the whole analysed period. The significant reduction in 2017 was mainly related to the reduction of natural gas consumption by 38% and the increase in electricity consumption by 5% compared to 2016. The dynamics of natural gas and electricity by non-energy sub-sectors are provided in Figures 39 and 40, respectively.

Figure 38: Final energy consumption of non-energy industries by fuel type, 2008–2017, Mtoe

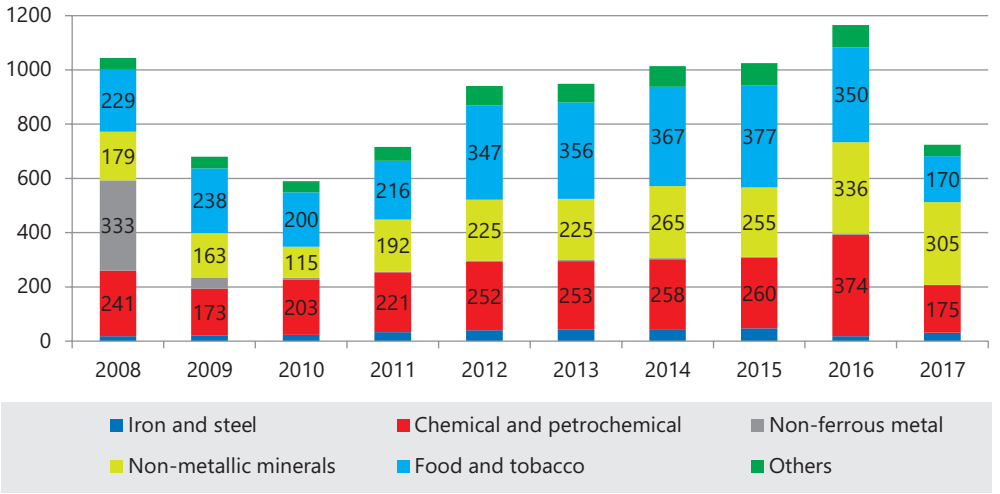


Source: State Statistics Committee, 2019

Figure 39 indicates the following major changes in the natural gas consumption of the non-energy sector:

- Reduction of energy consumption by non-ferrous metals from 333 mcm in 2008 to 42 mcm in 2009 and fluctuation of consumption at the level of 1-8 mcm during 2010–2017 (see more details below);
- Almost identical dynamics of food and tobacco as well as chemical and petrochemical sub-sectors, where gas consumption by sectors dropped by about 20% during 2009–2010, gradually increased in energy consumption during 2011–2016 and decreased by 50% in 2017;
- 36% decrease in consumption by non-metallic minerals in 2008–2010, almost threefold increase during 2011–2017 and 10% decrease in 2017;
- Gradual twofold increase of other consumption during 2009–2016 and 50% decrease in 2017;
- Insignificant but relatively stable consumption by iron and steel.

Figure 39: Natural gas consumption by non-energy industries, 2008–2017, mcm

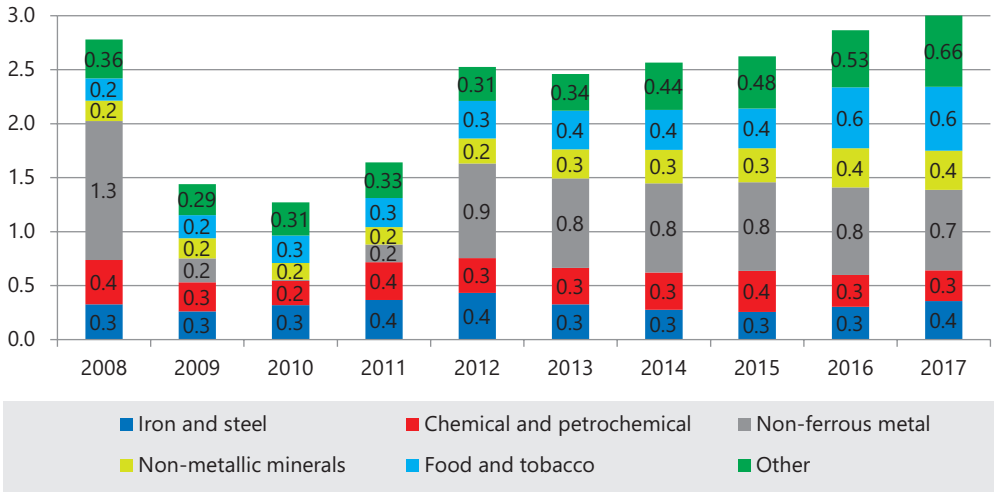


Source: State Statistics Committee, 2019

Figure 40 illustrates the following dynamics of electricity consumption by non-energy industry sub-sectors:

- Consumption by non-ferrous metals, the largest non-energy consumer, decreased from 1.3 TWh in 2008 to almost zero in 2010 and fluctuated at the level of 0.7-0.9 TWh during 2012–2017 (see more details below);
- Food and tobacco – gradual threefold increase during 2008–2017;
- Non-metallic minerals – gradual twofold increase during 2008–2017;
- Iron and steel, Chemical and petrochemical – relatively stable consumption;
- Other – 20% decrease in 2009 and more than twofold increase during 2010–2017.

Figure 40: Electricity consumption by non-energy industries, 2008–2017, TWh



Source: State Statistics Committee, 2019

Deeper analysis of the consumption by non-ferrous metal enterprises, the largest non-energy consumers, is based on the analysis of the following three aluminium plants that mainly represent this sub-sector:

- Sumgait Aluminium Smelter Plant. The plant was constructed in 1956 and produced primary aluminium from alumna using a rather obsolete electrolysis technology requiring a large amount of electricity. In 2009–2010, the plant sharply reduced the production of primary aluminium: from 60,000 ton/year to 400-600 ton/year (reduction by 100 times). Therefore, electricity consumption in this sub-sector decreased from 1.3 TWh in 2008 to almost zero in 2010 (see Figure 40);
- Ganja Alumina Plant. The plant was constructed in 1966 and produced aluminium oxide (alumina), a raw material for the further production of primary aluminium. The technological process of alumina used was also rather obsolete and required the large consumption of heat (natural gas), steam, water and electricity. The plant significantly reduced the production of alumina from 306,300 tonnes in 2008 to 36,600 tonnes in 2009 and ceased alumina production in 2012. Therefore, natural gas consumption fell in this sub-sector from 333 mcm in 2008 to 42 mcm in 2009 (see Figure 39);
- Ganja Det.Al Aluminium Complex was put into operation in October 2011. It produces primary aluminium and semi-final aluminium products. Its modern electrolysis technologies allow it to use about 30% less energy compared with the Sumgait Aluminium Smelter Plant. Thus, Det.Al Aluminium Complex has remained the only major player in this market since 2012 and predominated electricity consumption by the non-ferrous metal sub-sector during 2012–2017 (see Figure 40).

9.3.2. Assessment of Existing Energy Efficiency Potential

Three studies have estimated the energy efficiency potential of the country's industrial energy sector:

- Energy efficiency Orbits for Transition Economies, developed by the Center for Energy Efficiency (CENEf) and the Copenhagen Centre on Energy Efficiency (C2E2) in 2015;
- Energy Efficiency in Industrial Sectors in Georgia and Azerbaijan, developed within the High Quality Studies to Support Activities under the Eastern Partnership (HiQSTEP) Project funded by the European Commission in 2018;
- NAMAs for Low-Carbon End-Use Sectors in Azerbaijan.

The CENEf's estimate of the technical energy efficiency potential for industry is 1.844 Mtce (equivalent of 1.29 Mtoe)[122] or about 53% of the sector's annual energy consumption in 2013. Table 14 provides a breakdown of the CENEF's estimates, based on global practice. Nevertheless, the CENEf remarks that the data provided are subject to many assumptions and should be used mainly for indicative purposes.

Based on analysis of the CENEf's findings, reducing associated petroleum gas (APG) flaring emerges as a clear priority for the industry sector given the large technical potential and economic attractiveness of this measure. It should also be noted that in 2008, SOCAR officially joined the Global Gas Flaring Reduction Partnership (GGFR) led by the World Bank[123] and has actively cooperated with more than 30 countries and oil companies in this area since then. For example, during 2008–2010, SOCAR reduced APG flaring and venting from 494 million m^3 to 276.4 million m^3 per year, or by 45%.[124]

Associated gas capturing is also one of the NAMA's pilot projects, the implementation of which started in 2018. The project targets capturing associated gas from the existing on-shore Siyazzaneft oil-field and directing it to nearby residential areas, whose energy needs are currently covered using liquefied petroleum gas (LPG), kerosene and wood, which is causing deforestation in the area. Siyazanneft Oil and Gas Production Unit, one of SOCAR's six on-shore facilities, is located 100 km north of Baku. Siyazanneft includes about 550 wells in a territory of approximately 2,000 hectares. According to NAMA, about 73,2000 m^3 of gas is aired daily, or about 27 million m^3 yearly (based on 2014 data). The amount of methane in the associated gas is as high as 80%, corresponding to 21 M m^3. Thus, the implementation of this project can potentially result in the reduction of about 313,000 tonnes of CO_2 per annum.

The CENEf's findings also indicate significant potential in improving the efficiency of oil refinery, steam supply and motors. Moreover, the analysis demonstrates that the considerable technical potential offered by the industrial sector is particularly economically attractive. Nevertheless, the technical and cost-effective potential identified should be confirmed by the results of energy audits and/or by the implementation of energy management systems (EMS).

The HiQSTEP estimates EE potential in industry based on the results of walk-through energy audits of SMEs belonging to wood products and manufactured plastics. One of the key observations of the audits is the wide utilisation of obsolete and inefficient

122 Energy Efficiency Orbits for Transition Economies, Center for Energy Efficiency (CENEf), Copenhagen Centre on Energy Efficiency (C2E2), available at http://www.cenef.ru/file/Final%20Report_C2E2_CENEf_June2_2015.pdf (accessed July 2019).
123 https://www.azernews.az/business/131529.html (accessed July 2019).
124 Azerbaijan: Reducing Associated Petroleum Gas Flaring and Venting, WB, available at http://documents.worldbank.org/curated/en/400881467997261628/pdf/904020BRI0Resu00Box385307B00PUBLIC0.pdf (accessed July 2019).

equipment for both process-specific and horizontal technologies, like steam generation and compressed air systems. The study provides a lists of potential energy-saving measures based on the best available technologies, but does not identify specific energy-saving potential for industrial sub-sectors of Azerbaijan.

Table 14: Energy efficiency potential in industry in Azerbaijan (as of 2013)

Integrated technologies of goods, work, and services production	Units	Volume of economic activity	Units	Specific consumption in 2013	Practical minimum	Actual consumption abroad	Comments	Estimated technical potential, 1000 tce
Oil production	10^3 t	43,500	kWh/t	10	10		Astrakhanskaya Oblast	0
Oil refinery	10^3 t	6,761	kgce/t	87	53.9	71	Global practice	224
Natural gas production	10^6 m^3	17,895	kgce/ 1000 m^3	8.7	5,9		Expert estimate	49.8
Iron ore production	10^3 t	141	kgce/t	12.5	8.5	10	Global practice	0.6
Rolled ferrous metal products	10^3 t	255	kgce/t	113.1	31	68	Global practice	21.0
Ethylene	10^3 t	79	kgce/t	799	458	683	Global practice	26.8
Cement production	10^3 t	2,296	kgce/t	13	11	13	Global practice	4.6
Meat and meat products	10^3 t	285	kgce/t	211	50		Chelyabinskaya Oblast	45.9
Bread and bakery	10^3 t	1,181	kgce/t	157	89		Tambovskaya Oblast	80.1
Efficient motors	10^6 units	0.6	kWh/ motor	9956	8507		Global practice	103.1
Variable speed drives	10^6 units	0.3	kWh/ drive	9956	9356		Global practice	19.2
Efficient compressed air systems	10^6 m^3	3,381	kgce/ 1000 m^3	18	7		Global practice	39.4
Efficient oxygen production	10^6 m^3	614	kgce/ 1000 m^3	112	90		Global practice	13.8
Efficient industrial lighting	10^6 units	2	kWh/ lighting unit	247	160		Global practice	24.5
Efficient steam supply	10^3 tce	435	%	75%	100%		Global practice	108.9
Fuel savings in other industrial processes	10^3 tce	249	%	80%	100%		Global practice	49.7
Associated gas flaring	10^6 m^3	17,895	%	10.0%	5.0%		Federal requirements	1,033
Total								1.844

Source: CENEf as quoted in C2E2 (2015).

The recommendations of the HiQSTEP study include the development of capacity-building activities, improvement of the existing legislative framework, introduction of financial incentives and introduction of monitoring of policy and measures implementation. Among the specific measures with the highest energy efficiency potential, the study identifies the utilisation of heat recovery systems and the replacement of inefficient motors, pumps, boilers and other equipment with energy-efficient analogues.

A good example among the identified EE measures in industry is the replacement of inefficient motor systems with modern ones that on average consume up to 40% less energy. Indeed, the potential for high energy efficiency from replacing motors is significant in many countries, as about 30% of global electricity consumption is used in industrial electric motor-driven systems.[125] According to the IEA, almost nine out of ten industrial electric motors sold globally are already covered by mandatory efficiency standards with various levels of stringency. However, there are no minimum energy performance standards on energy motors and pumps in Azerbaijan (see Chapter 9.5). At the same time, this policy measure pertains to new appliances only. Therefore, the main challenge for the improvement of the efficiency of industrial motor systems in Azerbaijan is to determine how to improve the efficiency of existing appliances or to accelerate the cost-effective replacement of old, inefficient equipment with energy-efficient ones.

International practice shows that the most effective incentives for industry to implement EE measures are price signals, easy access to low-cost finance such as soft loans for EE improvements provided by the government or international financial institutions, the introduction of mandatory energy audits at the state level, the promotion of EMS and incentives to implement opportunities identified by audits or EMS. For example, since June 2014, energy audits have been mandatory in EU member states for all large enterprises[126] that employ over 250 persons or that have an annual turnover exceeding 50M euros and/or an annual balance sheet total exceeding 43M euros. Such mandatory audits must be conducted every four years, although companies employing a certified energy and environment management system can be exempted from this obligation. According to the EED, the implementation of energy audits' recommendations is not mandatory. However, some EU member states have recognised the benefits of EE improvements in industry for local economic development and have therefore introduced specific requirements for the mandatory implementation of cost-effective measures identified in energy audits. For example, industrial companies in Flanders, Belgium must implement all recommended energy-saving measures that meet the minimum profitability and payback requirements.[127]

From the state's point of view, energy audits should be considered not only as a tool for improving a company's energy efficiency performance, but as a tool to identify potential DSM opportunities for the energy system, to improve the competitiveness of the national economy and to attract new investments. One of the requirements of international energy audit standards such as ISO 50001 ("Energy Management Systems – Requirements with Guidance for Use") is that the recommendations of energy audits should be based on a life-cycle cost analysis to take account of long-term energy savings, residual values of

125 2016 IEA World Energy Outlook.

126 Large enterprises are defined according to Commission Recommendation 2003/361/EC of 6 May 2003.

127 A Study on Energy Efficiency in Enterprises: Energy Audits and Energy Management Systems, European Commission, 2015, available at https://ec.europa.eu/energy/sites/ener/files/documents/EED-Art8-Energy%20audits%20recommendations-Task%205-report%20FINAL.pdf (accessed July 2019).

investments and discount rates. Thus, the results of energy audits can be used directly to attract investment, a long-term priority for Azerbaijan (see Chapter 5.1).

9.3.3. Existing Policies and Implementations

State programmes related to industry

There are three industrial sector policy documents in force:

1. State Program on the Development of Industry in the Republic of Azerbaijan in 2015–2020, approved by Presidential Decree No. 964 dated 26 December 2014;
2. Strategic Road Map on the Development of Heavy Industry and Machinery, approved by Presidential Decree dated 6 November 2016;
3. Strategic Road Map on the Development of the Oil and Gas Industry (Including Chemical Goods), approved by Presidential Decree dated 6 November 2016 (not publicly available).

State Program on the Development of Industry in the Republic of Azerbaijan in 2015–2020

The Programme is aimed at the diversification of manufacturing products, setting up technologies through the entire technological chain, from raw materials to products with high added value, the development of environmentally friendly technologies and efficient energy use by enterprises. However, the document does not stipulate any specific policy measures or targets related to EE in industry.

Strategic Road Map on the Development of Heavy Industry and Machinery

The SRM includes an action plan for 2016–2020, a long-term outlook by 2025 and a vision beyond 2025. However, the SRM does not include any specific EE targets.

The action plan, as part of the SRM, includes general targets on improving the competitiveness of national industry, financial support, international cooperation and the optimisation of the use of existing assets, including incentives for the rational use of energy and shifting technological processes to off-peak hours. However, the action plan also envisages measures that can potentially disincentive EE, like ensuring non-cost-reflective or preferential energy tariffs for heavy industry, in particular iron and steel sub-sectors and strategic enterprises.

Mandatory energy audits

There are no requirements for mandatory energy audits for industrial enterprises in Azerbaijan. However, this policy measure is one of the requirements of the draft Law on EE prepared within the EU4Energy programme. Namely, Article 8.4 of the draft EE Law stipulates that regardless of ownership, an enterprise consuming more than 500 toe per year must undergo a mandatory energy audit.

The recently approved Decree of the Cabinet of Ministers No. 257 dated June 4, 2019 On Approval of Regulatory Acts Related to Improving the Performance of Legal Entities, the controlling stake of which belongs to the state,[128] introduces the following documents for such companies:

128 The list of legal entities where the state owns the controlling block of shares is approved by the Cabinet of Ministers Decree No. 534 dated 30 December 2016 and includes the following enterprises: 1. SOCAR, 2. Azerenerji OJSC, 3. Azerishiq OJSC, 4. Azal OJSC, 5. AzRailways CJSC, 6. Azersu OJSC, 7. Azerbaijan Caspian Shipping CJSC, 8. Baku Metropoliten CJSC, 9. Azerbaijan Melioration and Water Supply JSC and 10. Azerkosmos OJSC.

1. Procedure for evaluating performance;
2. Standards and rules of corporate management;
3. Order of payment of bonuses to members' governing bodies based on performance.

However, the above documents stipulate only one indicator related to energy efficiency – "energy cost share in the production cost" – as one of the performance indicators.

Availability of high-quality energy audits

None exist.

Energy management systems (EMS)

There is a provision about EMS in the abovementioned draft Law on EE.

Financial incentives

Currently there are no state incentive schemes (such as soft loans, grants or tax relief) to encourage industrial consumers to implement EE measures. The tariff policy of Azerbaijan and energy-related subsidies aim to keep energy tariffs at a low level (see Chapter 4 for more details) and do not provide any incentives for implementing EE measures. In fact, the subsidised energy tariffs increase the payback period and cost-effectiveness of EE measures.

Demand-side management and load shifting

The electricity tariff system stipulates time-of-use tariffs, but only for specific energy-intensive industrial enterprises that consume more than 5 MWh per month. At the same time, the existing time-of-use tariffs also include additional state subsidies as their level is lower than tariffs for other industrial enterprises (see Chapter 4.1 for more details):

- Day tariffs (08.00 - 22.00) – 5.8 gepik/kWh;
- Night tariffs (22.00-08.00) – 2.8 gepik/kWh;
- Other industrial enterprises – 9 gepik/kWh (regardless of voltage or capacity).

There is no ancillary services market in Azerbaijan and the existing regulatory framework does not provide the possibility for energy-intensive consumers to take part in the balancing of the electricity market. Taking into account the high level of electricity consumption by aluminium, steel and other energy-intensive enterprises (see Figure 40), there is significant potential for the utilisation of demand-side measures in Azerbaijan.

For example, aluminium electrolysis can provide effective demand-side flexibility for the power system, as the power demand of the electrolysis process can be reduced by up to 25% for up to four hours without negative implications.[129] Compared to aluminium production, steel manufacturing processes are more complicated industries to schedule.[130] Nevertheless, steel-producing factories are providing useful demand-response in various jurisdictions around the world; around half of the steel mills in Germany have pre-qualified their furnaces in the tertiary reserve market as positive capacity.[131]

129 Shoreh et al. "A Survey of Industrial Applications of Demand Response", Shoreh et al., Electric Power Systems Research, Volume 141, December 2016, pp. 31-49.
130 Ibid.
131 Ibid.

DSM programmes and prices need to be designed to deliver optimal outcomes for the industry providing the DSM services, the power system operator, TSO and DSO as well as wider society. It is necessary to properly understand the load profiles of the industries, the possible options for providing demand response (with effective management of trade-offs against energy efficiency) and the price/tariff designs and regulatory requirements that will enable the best options (e.g. inclining block rates with larger number of blocks; time-of-use pricing for all consumers; critical peak pricing).

Ecodesign

There are no ecodesign or minimum energy performance standard (MEPS) for industrial appliances in Azerbaijan. However, this policy measure is one of the requirements of the draft Law on EE prepared within the EU4Energy programme.

Energy Service Company (ESCO)

No ESCO exist in Azerbaijan, although there is a provision about ESCO in the abovementioned draft Law on EE.

9.3.4. Main Barriers Identified

Summarising the key findings and conclusions of this chapter, the following main barriers have been identified:

- There are insufficient data and information regarding technical and economic energy efficiency potential in the industrial sector in general and strategic sub-sectors in particular;
- Existing statistics do not provide detailed information on energy consumption by the energy sector (energy industry own use);
- The non-cost-reflective energy tariffs do not provide any incentives or price signals for the implementation of EE measures. The exiting tariff design does not stimulate the efficient use of the existing electricity system, i.e. the electricity prices do not depend on the voltage and capacity, there does not exist time-of-use pricing for all consumers, critical peak pricing, etc.;
- There is no ancillary services market in Azerbaijan and the existing regulatory framework does not provide the possibility for energy-intensive consumers to take part in the balancing of the electricity market;
- The existing legislative framework does not stipulate the EE target for industry and in some cases discourages the implementation of EE measures by envisaging non-cost-reflective energy tariffs for specific industries and enterprises. Consequently, there are no supportive regulatory arrangements, such as energy audits or EMS and certification procedures, training/certification schemes for energy auditors for industrial enterprises or financial incentives to encourage the implementation of identified EE improvements;
- There is low awareness of the multiple benefits associated with improving EE among decision makers;
- There are no ecodesign or MEPRs for industrial appliances in Azerbaijan, resulting in the wide utilisation of inefficient and old appliances and equipment.

Recommendations: Industry

14. Define clear responsibilities for the development and implementation of policy measures targeting EE in industry (see Recommendation 3), including in small and medium-sized enterprises (SMEs). Provide sufficient resources for managing the following key policy measures:
    - Mandatory energy audits for large industrial enterprises on a regular basis;
    - Incentives for SMEs to carry out energy audits on a regular basis;
    - Energy audit and training/certification schemes for energy auditors;
    - Energy management standards and certification procedures;
    - Financial incentives to encourage the implementation of EE improvements.
15. Prioritise the adoption and the implementation of ecodesign requirements for industrial appliances. Start with the introduction of ecodesign requirements for products that are less technically complex and contentious, but that can potentially bring the highest energy savings for industry, such as power transformers, water pumps and electric motors.
16. Initiate the development of benchmarking studies on technical and economic EE potential in the industrial sector in general and strategic sub-sectors in particular.
17. Develop support programmes to promote energy audits among SMEs, i.e. tax exemption or direct financial incentives to support the implementation of EE measures based on the results of the conducted energy audit, awareness-raising campaigns, etc.
18. Develop support mechanisms for local producers of modern EE equipment. The support mechanisms can include new incentive measures, subsidised loans, tax exemptions, etc.
19. Promote voluntary agreements and other industrial initiatives to stimulate EE in the industry. Support business initiatives targeting improvements in EE, including fiscal incentives for EE improvements and ESCO schemes.

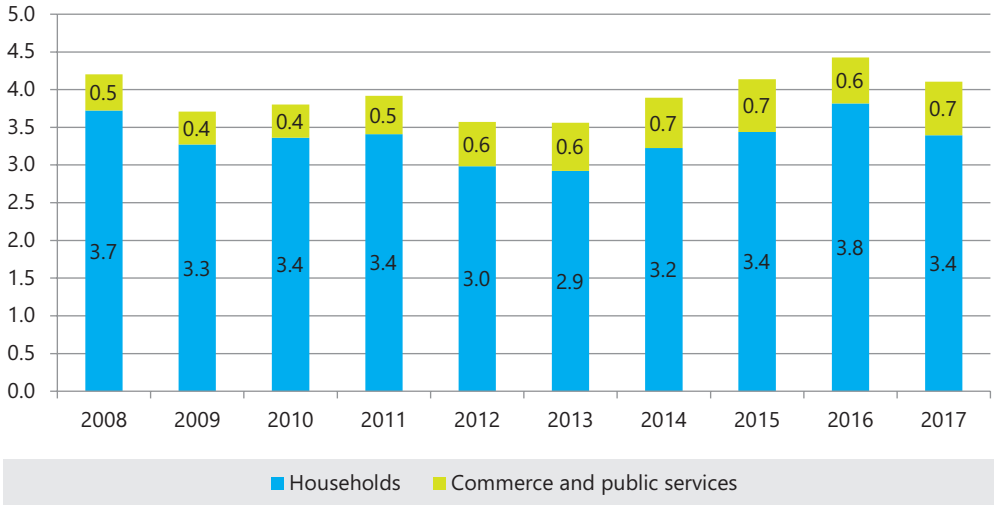
9.4. Buildings

9.4.1. Sector Overview and Consumption

State policy in areas of urban planning, architecture design and building requirements in Azerbaijan is implemented by the State Committee for Urban Planning and Architecture. There are no available data on the energy performance of buildings in Azerbaijan. In the absence of official statistical data, energy consumption in the buildings sector can be estimated based on available data for the residential and service sectors, as together they cover the energy consumption of buildings, including heating, cooling and appliances.

Analysis of the energy balances of the country (Figure 12) shows that the share of energy consumed by households, commerce and public services in TFC decreased from 51% to 43% over the last decade, mainly due to increased energy consumption by other sectors. At the same time, energy consumption by buildings in absolute terms in 2017 remained almost at the same level as in 2008 (Figure 41). Natural gas is the main source for heating and cooking in the residential sector and only 2.6% of residential buildings in Azerbaijan had access to district heating services in 2017. As for healthcare and education facilities, the district heating sector covered 26% of hospitals, 8.7% of pre-schools and 6.2 % of schools in 2017. Deeper analysis of natural gas consumption by residential consumers shows that about 70% of natural gas or about 2 bcm was used for space heating and 30% or approximately 1 bcm for cooking and hot water preparation in 2018.

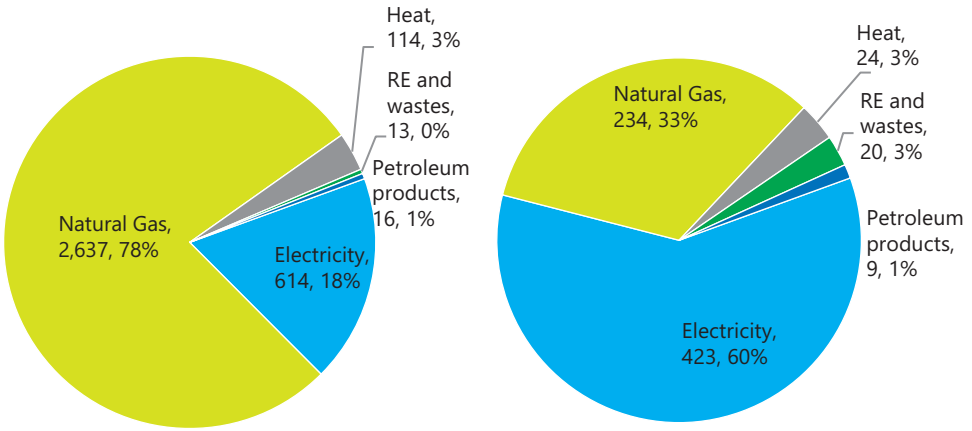
Figure 41: Energy consumption in buildings, 2008–2017, Mtoe



Source: State Statistics Committee, 2019

Figure 41 shows that consumption in the household sector decreased by 9%, while in the service sector it increased by 48% over the last decade. In 2017, consumption in the residential sector was almost five times higher than in the service sector. The energy mix in the two sectors also differed: in households natural gas predominated (78%), whereas in services the share of natural gas was only 33% while the share of electricity was 60% (Figure 42).

Figure 42: Share of energy mix in households (left) and commerce and public services (right) in 2017, ktoe



Source: State Statistics Committee, 2019

The high consumption of natural gas by households can be explained by the high gasification rate of 95.7% (see Chapter 3.2) as well as by the fact that natural gas is commonly used for cooking, space heating and hot water preparation. Individual modern boilers for space heating and hot water are widely used in individual houses in villages and in multi-apartment buildings in big cities. The high share of electricity in the service sector can be explained by the fact that it is mainly used for lightning and cooling, whereas natural gas is primarily used for hot water preparation.

As of January 2018, the total number of buildings (including multi-apartment buildings and private houses) was 1,431,449: in cities 605,122 (including Baku: 168 929) and in rural areas 826,327.The total number of dwellings was 2,009,244: in cities 1,164,928 (including Baku: 507,257) and in rural areas 844,816.[132] The dynamics of key indicators in terms of household building stock is presented in Table 15.

Table 15: Household building stock in Azerbaijan, 2008–2017

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Population, thousand people	8,780	2,039	2,065	2,092	9,235	9,357	9,477	9,593	9,706	9,810
Total area, M m^3	157	160	160	162	164	166	169	171	174	176
Total consumption by households, GWh	43,297	38,051	39,101	39,649	34,679	33,997	37,522	39,969	44,387	39,473
Average energy consumption, kWh/m^2/year	276	238	245	244	211	204	222	233	256	225

Source: Energy Charter Secretariat based on the data from State Statistical Committee, 2019

132 Source: State Statistical Committee, Residential Housing Stock. Bulletin, 2019.

Table 15 shows that the average energy consumption of residential buildings in Azerbaijan varied from 204 kWh/m^2/year in 2013 to 276 kWh/m^2/year in 2017. In total, average energy consumption decreased by almost 20%. Taking into account that no MEPRs were introduced during the analysed period for new or renovated buildings, it is believed that the reduction identified was the result of the following measures:

- Overall installation of natural gas and electricity meters;
- Increase of energy tariffs (see Chapter 3);
- Demolition of old and emergency low-rise housing stock (mainly relevant in Baku) and the construction of new and comfortable housing here, the demolition of houses and the withdrawal of territories for state needs for the implementation of infrastructure projects and the resettlement of residents in newly constructed buildings. In 2018 alone, the retirement of housing stock amounted to 530,000 square metres, 338,000 of which in Baku and the rest in large cities like Sumgait and Ganja;[133]
- Application of new technologies (such as new construction materials, efficient boilers and windows) in the construction of new buildings and in the retrofitting of existing buildings despite the absence of MEPRs.

9.4.2. Assessment of Existing Energy Efficiency Potential

Three studies have estimated the energy efficiency potential of the building sector in Azerbaijan:

- INOGATE TA project ENPI 2009/216-206 Energy Saving Initiative in the Building Sector in Eastern Europe and the Central Asian Countries (ESIB), funded by the European Commission and implemented during 2010–2014;[134]
- Energy Efficiency Orbits for Transition Economies, developed by the Center for Energy Efficiency (CENEf) and the Copenhagen Centre on Energy Efficiency (C2E2) in 2015;
- Nationally Appropriate Mitigation Actions (NAMAs) for low-carbon end-use sectors in Azerbaijan, a four-year project (2015–2019) funded by Global Environment Facility (GEF), UNDP and SOCAR.[135]

The ESIB project undertook an energy audit of a nine-storey multi-apartment building in Baku, a common type of panel building typically built in the majority of the Former Soviet states during 1970-1990. The energy consumption of such buildings represents a large share of that of the city as a whole. A typical building consists of 162 apartments with a total heating space area of 12,204 m^2. The building in question was constructed without any thermal insulation and a computer simulation calculated the specific energy demand for space heating at the level of 210 kWh/m^2/year. The results of the audit showed that the implementation of recommended measures would provide a reduction in energy consumption for space heating by two times. Taking into account that about 70% of natural gas or approximately 2 bcm was used for space heating in 2018, the technical energy saving potential can be estimated at the level of 1 bcm per year.

133 Ibid.
134 Final report available at http://www.inogate.org/activities/579?lang=en (accessed August 2019).
135 The total budget of the NAMA is 35.47M USD, including GEF – 3.57, UNDP – 0.2M USD, SOCAR – 30.9 and MoENR – 0.8M USD available at https://www.thegef.org/sites/default/files/project_documents/08-07-2014_ID5291_projdoc_0.pdf (accessed August 2019).

The calculated cost of thermo-modernisation works for the whole building was 580 000 AZN and a CO_2 emissions reduction was expected at the level of 440 tonnes per year. However, taking account the non-cost-reflective domestic gas tariffs for the population (see Table 5), the simple payback of thermo-modernisation was more than 20 years. At the same time, it is worth considering that Azerbaijan is a net energy exporter and that the energy saved will increase the country's export potential as well as the income of the state budget. Furthermore, as export prices are several times higher than domestic ones (2-3 times), the payback calculated on the basis of export prices would be about eight years. This demonstrated huge energy saving potential that could be replicated in other multi-storey buildings throughout Azerbaijan.

The CENEf's estimate of the technical energy efficiency potential for buildings is 3.766 Mtce (equivalent of 2.636 Mtoe)[136] or about 74% of the annual energy consumption of household, commerce and public service sectors in 2013. Table 16 provides a breakdown of the CENEF's estimates, based on global practice. Nevertheless, the CENEf remarks that the data provided are subject to many assumptions and should be used mainly for indicative purposes.

The CENEf study estimates the largest technical energy saving potential from the renovation of single-family buildings to the standards of passive houses, specific renovation measures for multi-apartment residential buildings and the substitution of inefficient cooking appliances with modern ones. As for the service sector, the study estimated the greatest potential from the renovation of individually heated commercial buildings.

In the framework of the NAMA project, there were six retrofitted buildings belonging to SOCAR:

- Two administrative buildings of the Oil Sludge Waste Treatment Center (WTC) at Garadag (total area of 2,700 m^2);
- Two buildings in the Eco Park in Gala (total area of 1,300 m^2);
- Service building of AzerKimya Production Unit in Sumgayit (total area of 2,450 m^2);
- Chemists' Culture Palace in Sumgayit (total area of 3,500 m^2).

The renovation measures included the insulation of the building envelope, roof and basement and the installation of new efficient windows and lighting. The energy audit conducted revealed 50% energy saving potential as a result of the thermal renovation of existing public buildings.

Despite the fact that Azerbaijan is a country with comparatively high potential for solar energy, there are no publicly available studies or reports on the benefits of utilising solar water heating systems in the residential, commercial and public sectors.

136 Energy Efficiency Orbits for Transition Economies, Center for Energy Efficiency (CENEf), Copenhagen Centre on Energy Efficiency (C2E2), available at http://www.cenef.ru/file/Final%20Report_C2E2_CENEf_June2_2015.pdf (accessed July 2019).

Table 16: Energy efficiency potential in buildings in Azerbaijan (as of 2013)

Integrated technologies of goods, work, and services production	Units	Scale of economic activity	Units	Specific consumption in 2010	Practical minimum	Actual consumption abroad	Comments	Estimated technical potential, 1000 tce
Housing								
Multi-family buildings renovation	10^3 m^2	32,200	kgce/t	25.7	7.1	20.6	60% of 2012 building codes requirements	599
Single-family buildings renovation	10^3 m^2	80,000	kgce/ 1000 m^3	33.0	4.9	20.6	Passive buildings	2,248
Replacement of appliances with top efficient models	10^3 people	9,356	kgce/t	0.044	0.022	0.12	Global practice	206
Lighting renovation	10^3 light fixtures	36,839	kgce/t	50.85	20.00	35.0	Global practice	77
Renovation of the cooking equipment	10^3 m^2	112,200	kgce/t	3.50	1.50	2.80	Global practice	224
Total residential buildings								3,353
Public and commercial buildings								
Renovation of centrally heated commercial buildings	10^3 m^2	7,050	kgce/t	26.0	7.1	18.0	60% of 2012 building codes requirements	77.0
Renovation of hot water use	10^3 m^2	5,875	kWh/ motor	4.90	2.7	3.3	Global practice	12.9
Renovation of the cooking equipment	10^3 m^2	5,640	kWh/ drive	1.8	1.4	1.3	Global practice	2.1
Renovation of individually heated commercial buildings	10^3 m^2	16,450	kgce/ 1000 m^3	32.7	4.9	30.2	Global practice	215.5
Lighting renovation	10^3 m^2	23,000	kgce/ 1000 m^3	32.7	16.4	27.8	Global practice	47.3
Procurement of efficient appliances	10^3 m^2	23,000	kWh/ lighting unit	71.8	51.6	56.6	Global practice	58.3
Total public and commercial buildings								413
Total buildings								3,766

Source: CENEf as quoted in C2E2, 2015

9.4.3. Existing Policies and Implementations

Minimum energy performance requirements (MEPRs)

There are no minimum energy performance requirements for new or renovated buildings in Azerbaijan, but the draft Law on EE clearly stipulates the development of these policy instruments (see Chapter 5.2 for more details). Despite the absence of MEPRs, there are a number of other initiatives led by international companies operating in Azerbaijan, including the following:

- The buildings of the Diplomatic Academy have been certified according to the Leadership in Energy and Environmental Design (LEED) standards;
- The Fairmont Baku Flame Towers Hotel have been certified by Green Zoom Azeri standards[137] (local green standards on EE based on Russian standards Green ZOOM);
- The residential complex Seven Points in Baku has been constructed using modern thermo-insulation technologies of the building envelope.

Exemplary Role of the Public Sector

There are no specific provisions on the exemplary role of public buildings, but restrictive measures have recently been approved aimed at limiting the energy consumption of public consumers funded from the state or municipal budgets, i.e. schools, hospitals, pre-schools, central executive power authorities and their sub-ordinates, local governments, municipalities and so forth (see Chapter 5.2 for more details).

9.4.4. Main Barriers Identified

Summarising the key findings and conclusions of this chapter, the following main barriers have been identified:

- There are no specific targets regarding the improvement of energy efficiency in public and residential new and existing buildings;
- Outdated standards of building thermal protection;
- No MEPR for new or existing buildings;
- Low level of capacity regarding the cost-optimal energy performance of buildings among decision makers, businesses and the wider population;
- No financial incentives or state support for the improvement of EE in buildings;
- Low awareness about no-cost or low-cost EE measures in public and residential buildings;
- No incentives for local municipalities and owners of buildings to reduce energy consumption;
- Non-cost-reflective energy prices result in a long payback period and low motivation for public and residential buildings;
- There are no publicly available studies or reports on the benefits of utilising solar water heating systems in the residential, commercial and public sectors;
- There are issues with respect to accounting energy savings in public buildings' budgets.

137 See: https://www.sciencepubco.com/index.php/ijet/article/view/14590/5939 (accessed August 2019).

Recommendations: Buildings

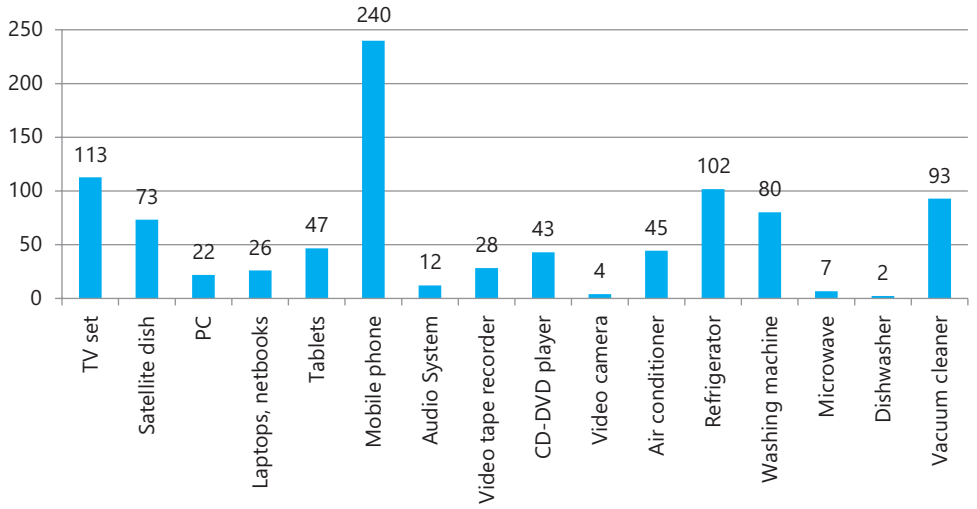
20. Define clear responsibilities for the development and implementation of policy measures targeting energy performance in buildings (see Recommendation 3). Provide sufficient resources for managing the following key policy measures:
    - Minimum energy performance requirements (MEPRs);
    - Energy performance certificates and certification procedures;
    - Financial incentives to encourage improvements in energy performance;
    - Public procurement criteria related to EE to be applied to public buildings.
21. Promote the exemplary role of the public sector with regard to building renovation. Prioritise the implementation of EE measures in public and state-owned buildings. Introduce specific sub-targets for improving efficiency in buildings.
22. Introduce MEPRs for buildings based on overall energy performance (kWh/m^2/year). Gradually make more stringent MEPRs to achieve nearly zero-energy buildings.
23. Design the Energy Performance Certification scheme as a self-funding mechanism, where the revenue from issuing Energy Performance Certificates covers all costs related to its management and quality assurance. Design the Energy Performance Certificates' software in such a way that the collected information on buildings' energy performance is automatically available for the State Statistics Committee of Azerbaijan and for a wider decision-making process.
24. Initiate the development of a study on the potential use of solar thermal systems in Azerbaijan. Evaluate the potential of solar thermal systems to contribute to the electricity system's development in a more cost-effective way compared to the supply-side option. Based on the results of the study, develop a supporting mechanism for the installation of solar thermal systems in residential and service sectors. Evaluate the costs of running this support scheme against the multiple benefits for the Azerbaijani economy, creation of jobs, increase of investments, increase of electricity exports, decrease of electricity consumption during peak hours and investments in network reinforcement, etc. Consider opportunities for the creation of additional incentives for local producers of solar water heating systems.
25. Introduce incentives for local authorities and the owners of public buildings to reduce energy consumption and implement EE measures. Local authorities should be allowed to use energy savings for the repayment of investment in EE and, once the debt has been repaid, to keep the energy savings each year.
26. Initiate the development of a study on technical and economic EE potential in residential buildings. Conduct targeted campaigns to improve consumers' awareness of their historical energy consumption and promote no-cost or low-cost measures to reduce their energy bills. Ensure that consumers have easy access to information about their historical consumption (up to a three-year period). Conduct awareness-raising campaigns on no-cost and low-cost measures to reduce energy bills based on international best practices and promoted nationwide.

9.5. Energy-using Products

9.5.1. Sector Overview and Consumption

There are no official statistics on the energy consumed by energy-using products in Azerbaijan. The last publicly available survey on energy consumption in households, conducted by the SSC in 2010, only provides the total figures for energy consumption by fuel without any breakdown per appliance.[138] However, the SSC provides detailed information on the average number of energy-consuming products per 100 households (Figure 43).

Figure 43: Energy-consuming products, units per 100 households



Source: State Statistics Committee, 2019

9.5.2. Assessment of Existing Energy Efficiency Potential

Figure 43 illustrates the high penetration of most energy-intensive consuming appliances, like refrigerators, washing machines, vacuum cleaners and television sets. Interesting observations include the very low share of dishwashers. Indeed, the potential use of dishwashers instead of handwashing may imply a significant reduction in the energy and water, as the latest A+++ dishwasher models use up to ten times less water and two times less energy compared to handwashing.[139] Unfortunately, there is no publicly available information on the growth rate of the number of air conditioners, even though they significantly contribute to households' increased electricity consumption and have among the greatest energy-saving potential.

138 "About the Results of the Survey on Fuel and Energy Consumption in Households in 2010", SSC, available at https://www.stat.gov.az/source/balance_fuel/en/Househ.pdf (accessed August 2019).

139 Based on information provided within the following sources: http://www.candy.ae/en_GB/ask-candy/-/asset_publisher/6eeUAvIfXnpd/content/is-it-true-that-the-dishwasher-uses-less-water-than-washing-by-hand-/maximized & https://www.telegraph.co.uk/interiors/home/best-dishwashers/ & https://giynow.com/2017/12/31/hand-washing-x-dishwasher-the-verdict/ (accessed August 2019).

There are two key studies that have estimated the EE potential of energy-using products in Azerbaijan:

- Energy Efficiency Orbits for Transition Economies, developed by the Center for Energy Efficiency (CENEf) and the Copenhagen Centre on Energy Efficiency (C2E2) in 2015;
- United for Efficiency (U4E) Global Map, which includes Azerbaijan's Savings Assessments for introducing minimum energy performance standards for five product groups.[140]

The CENEf study illustrates that the replacement of appliances with the most efficient models can potentially save 0.206 Mtce (equivalent to 0.144 Mtoe) and the replacement of lighting 0.077 Mtce (equivalent of 0.054 Mtoe) or 7% of total energy consumption by households in 2013 (see Table 16). The study also identifies significant potential for efficient appliance in services and industry. Regarding the latter, the technical potential for the substitution of inefficient motors with modern ones is 0.103 Mtce (equivalent of 0.072 Mtoe) or 6% of total energy consumption by the industry sector in 2013 (Table 14).

According to the United for Efficiency (U4E), Azerbaijan can achieve up to 16.98 TWh or about 1.46 Mtoe of cumulative energy savings in 2040 by introducing MEPS for five product groups (Table 17).

Table 17: Potential energy savings from the introduction of MEPS in Azerbaijan

	Total	Lighting	Residential refrigerators	Room air conditioners	Industrial electric motors	Distribution transformers
Annual savings in 2030						
Electricity, TWh	**0.88**	0.16	0.44	0.18	0.055	0.045
electricity bills, million USD	**35.7**	6.3	18.0	7.4	2.2	1.8
CO_2 emissions, million tonnes	**0.63**	0.11	0.32	0.13	0.039	0.032
Cumulative savings in 2030						
Electricity, TWh	**6.1**	2.1	2.4	1.0	0.31	0.24
electricity bills, million USD	**245**	85	97	41	12	10
CO_2 emissions, million tonnes	**4.33**	1.5	1.7	0.74	0.22	0.17
Cumulative savings in 2040						
Electricity, TWh	**16.98**	2.6	8.6	3.6	1.2	0.98
electricity bills, million USD	**688**	110	350	140	49	39
CO_2 emissions, million tonnes	**12.27**	1.9	6.2	2.6	0.87	0.7

Source: United for Efficiency Azerbaijan Assessment, 2019

Comparing the savings estimated by U4E with the TFC of the country (Figure 12) indicates that the cumulative savings from introducing MEPS for these five product groups until 2040

140 EU4Efficiency country profile Azerbaijan, available at https://united4efficiency.org/wp-content/uploads/2019/09/AZE_U4E-Country-Saving-Assessment_All.pdf (accessed October 2019).

will be almost equal to the total consumption of the industrial, construction, agricultural, forestry and fishing sectors of Azerbaijan in 2017 (see Figure 12).

Energy labelling and ecodesign (the EU definition of MEPS) are among the most effective tools in the EU to deliver cost-effective energy savings. There is no publicly available information on the energy savings that will be realised with the introduction of the EU's ecodesign and energy labelling requirements for all product groups in Azerbaijan. Nevertheless, the energy savings are likely to be significant. For example, studies commissioned by the EC[141] estimate that ecodesign and energy labelling requirements can save the EU about 175 Mtoe of primary energy per year, which is more than Italy's total annual primary energy consumption or 490 euros per household per year. Approximating the EU figures to Azerbaijan, the implementation of all the EU's ecodesign and energy labelling policies can help the country to achieve annual savings of about 1 Mtoe of final consumption per year, which is more than the total consumption of non-energy industrial consumers in 2017 (see Figure 12).

Efficient appliances and lighting may not only provide significant energy savings, but bring financial benefits for the final consumers. As an example, Table 18 compares calculations of the simple costs of lighting using incandescent, fluorescent and light-emitting diode (LED) lamps.

Table 18: Comparison of the cost of lighting per 50,000 hours of work

Indicator	Incandescent lamp	Fluorescent lamp	LED lamp
Lifetime, hours	1,000 (3 months)	10,000 (2,5 years)	50,000 (10 years)
Lamp wattage, W	100 W	21 W	10 W
Cost of the bulb	1 AZN	5 AZN	10 AZN
Number of bulb replacements per 50,000 hours of operation	50	4	1
Total cost of bulbs (replacement of bulbs)	50 AZN	20 AZN	10 AZN
Energy consumed, kWh	5000 kWh	1050 kWh	500 kWh
Total cost of energy*	350 AZN	73.5 AZN	35 AZN
Total cost (replacement of bulbs + energy)**	**400 AZN (211 EUR)**	**77.5 AZN (41 EUR)**	**36 AZN (19 EUR)**

** Calculated based on household tariff with monthly consumption below 300 kWh (0.07 AZN/kWh, see Table 4).*

*** Using the following exchange rate: 1 EUR = 1.90124 AZN[142]*

Source: Energy Charter Secretariat, 2019

The analysis presented in Table 18 shows that the substitution of incandescent lamps with LEDs not only reduces energy consumption for lighting tenfold, but also reduces the need to replace broken incandescent lamps every three months. Even with the actual non-cost-reflective electricity tariffs in Azerbaijan, the substitution of each LED lamp can save a household almost 192 EUR during the next ten years, the average lifetime of an LED lamp.

141 Ecodesign Working Plan 2016-2019. COM (2016) 773 final, p. 2.

142 https://www.xe.com/currencyconverter/convert/?Amount=1&From=EUR&To=AZN (accessed June 2019).

Given the above, it is clear that policies are required to drive the take-up of efficient appliances and to demote or retire inefficient appliances. There is also a significant body of international evidence indicating that product policies can quickly deliver very large benefits for consumers and the wider society. An ambitious product policy applying strict MEPSs and accelerating the turnover of inefficient stock using performance criteria, financial incentives and information can constitute a core strategy to relieve pressure on politically sensitive tariff increases.

It should also be mentioned that many Central Asian countries have recognised the benefits of the ban on incandescent lamps in improving the efficiency of the energy system, reducing consumer bills and creating new business opportunities. For example, 25W incandescent lamps were phased out in Kazakhstan from January 2014.[143] This successful experience was followed by Uzbekistan, which banned incandescent lamps of 40W and higher from January 2017.

Ecodesign is currently one of the highest impact EE policy measures and should be regarded as an investment delivering net benefits. A study published by the United Kingdom Department for Environment, Food and Rural Areas in 2015 concluded that each British pound invested in ecodesign generates 3.8 times that amount in earnings for the British economy.[144] This supports the case for pursuing additional energy savings and benefits by introducing policy and financial incentives to complement and support the ecodesign and labelling regulations in order to accelerate stock turnover and the transformation of product markets. A wide range of incentives have been used successfully in different jurisdictions and can include, for example, financial support for replacing old and inefficient appliances with energy-efficient models and tax incentives to influence product manufacturers' business development choices and consumers' purchasing decisions.

In addition to the energy-related products that are predominantly used in households, it is important to consider the EE potential of other products that are used in the industry and service sectors, for which it is also important to introduce MEPS (see Section 9.3.2).

The introduction of ecodesign requirements for LED lamps and other EE equipment will also create demand for these products and could spur the local production of modern equipment. This represents one of the objectives of the State Programme on the Development of Industry in the Republic of Azerbaijan in 2015–2020 (see Chapter 9.3.3)

9.5.3. Existing Policies and Implementations

The analysis of the existing policies and recommendations presented in previous chapters reveals that there are no policy instruments (like MEPS, import restrictions, labelling schemes or pricing signals) to promote the purchase of efficient energy-using products or to reduce purchases or encourage the retirement of inefficient products in Azerbaijan. Presented below is brief information on the key policy instruments and their potential implementation in Azerbaijan following the adoption of the draft Law on Energy Efficiency.

143 https://tengrinews.kz/kazakhstan_news/kazahstane-budut-shtrafovat-ispolzovanie-prodaju-lamp-298050/ (accessed June 2017).
144 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/406225/defra-regulation-assessment-2015.pdf (accessed June 2018).

Energy labelling and ecodesign

This does not currently exist. Energy labelling and ecodesign requirements are included in the draft Law on Energy Efficiency[145] as policy measures. The State Services of Antimonopoly Policy and Consumers Rights Protection[146] is the state authority responsible for implementing the standardisation policy.

Market surveillance and awareness raising

Market surveillance for energy-related products does not exist. Awareness-raising systematic campaigns targeted at economic operators (producers, suppliers, dealers) as well as to final consumers (citizens, legal entities) do not exist.

Public procurement

There are no incentives for governmental and local authorities to reduce energy consumption and EE indicators are not included as criteria in the public procurement rules. These issues are included in the draft Law on Energy Efficiency.[147]

9.5.4. Main Barriers Identified

Summarising the key findings and conclusions of this chapter, the following main barriers have been identified:

- No ecodesign (MEPS) and energy labelling requirements for energy-related products;
- Insufficient data and statistics on the imports and sales of energy-related products, which could serve as a basis for estimating energy-saving potential as well as for the design of targeted EE programmes;
- Lack of supporting mechanisms for the promotion of more energy-efficient technologies such as incentives, subsidised loans and tax incentives;
- Low awareness of final consumers on the benefits of using more energy-efficient appliances and lighting.

145 Status at the beginning of August 2019: under consideration by the Presidential Administration.
146 The State Services is a legal entity of public law subordinate to the Ministry of Economy.
147 Ibid.

Recommendations: Energy-using Products

27. Define clear responsibilities for the development and implementation of policy measures targeting the EE of energy-using products (see Recommendation 3). Provide sufficient resources for managing the following key policy measures:
    - Import ban on incandescent light bulbs;
    - Ecodesign regulations;
    - Energy labelling regulations;
    - EE criteria in public procurement procedures.
28. Prioritise the adoption and the implementation of ecodesign and energy labelling requirements, as one of the highest impact EE policy measures to achieve future EE targets. Start with the introduction of ecodesign requirements for products that are less technically complex and contentious and that can potentially bring the highest energy savings for residential consumers, such as heaters, air conditioners, dishwashers, washing machines and televisions.
29. Consider raising consumer awareness through information campaigns on energy labelling to inform consumers of the benefits and money they could save.
30. Enhance the capacity of involved stakeholders on the efficient implementation of ecodesign and energy labelling compliance, enforcement and market surveillance. Strengthen the cooperation and coordination of activities between all involved stakeholders (see Recommendation 3).
31. Provide general support and assistance to facilitate a higher uptake of highly efficient products and appliances. Develop targeted awareness-raising campaigns to enhance consumers' awareness of the benefits of using more energy-efficient appliances.

9.6. Transport

9.6.1. Sector Overview and Consumption

There are five main state-owned companies operating in the Azerbaijani transport sector: AzRailways CJSC, Azerbaijan Caspian Shipping CJSC, Baku International Sea Trade Port CJSC, Azal OJSC and Baku Metropoliten CJSC. There are also Azeravtoyol OJSC (which operates roads throughout the country) and the Baku Transport Agency (which is responsible for the management of transport in the capital). Despite the fact that the Ministry of Transport, Communications and High Technologies is the central executive body that implements state policy and regulation in the transport sector (see Section 5.4), in reality the above companies and the Agency report directly to the Cabinet of Ministers and do not necessarily coordinate their activities with the Ministry.

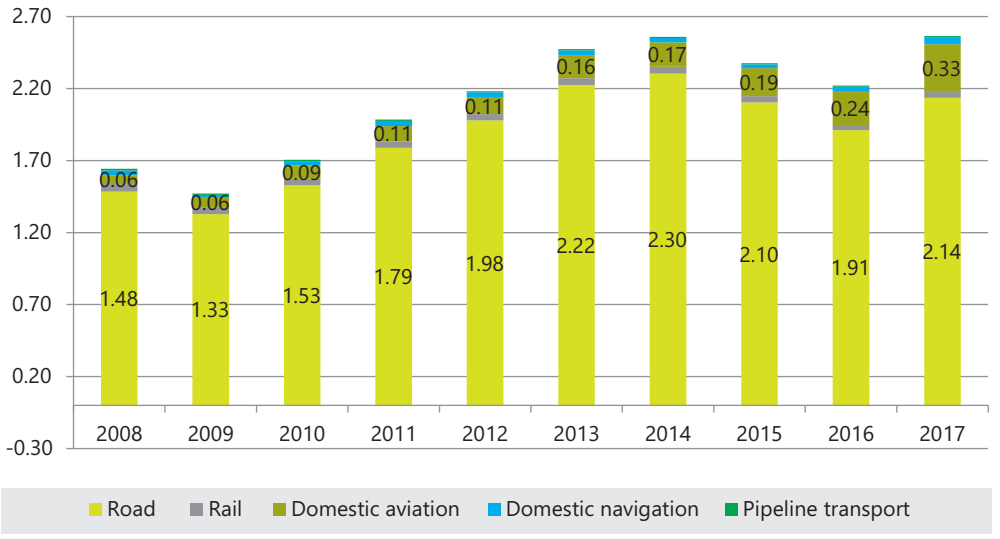
The transport sector's share of total final energy consumption increased from 20% to 28% over the last decade, mainly due to a significant increase in transport consumption (see Figure 12). Transport is the second-largest energy-consuming sector after households. In 2017, the sector contributed 6.7% to the GDP (see Figure 5) and employed 4.2% of the working population.

Figure 45 shows that energy consumption increased by 56% or from 1.6 Mtoe in 2008 to 2.6 Mtoe in 2017, mainly because of the following factors:

- Increase in road transport consumption by 0.7 Mtoe or by 44%:
- Increase in domestic aviation consumption by 0.3 Mtoe or almost fivefold.

Consumption by other types of transport was insignificant. However, it should also be mentioned that consumption by rail and pipeline transport decreased by 29% and 32%, respectively, over the same period.

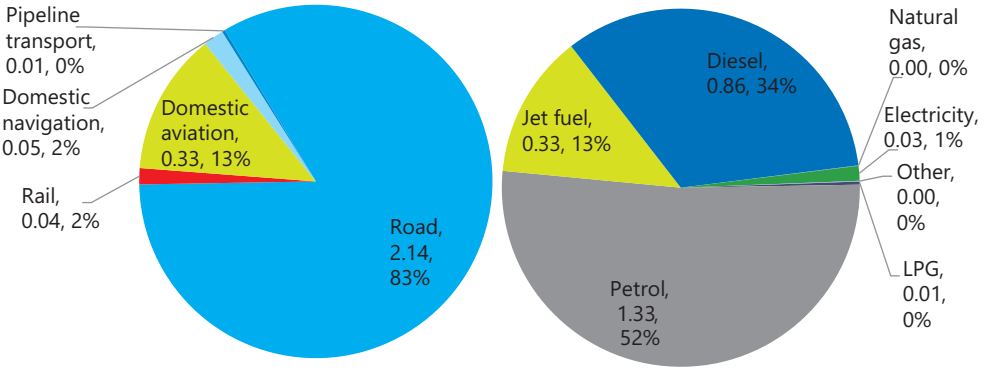
Figure 44: Energy Consumption by transport sector, 2008–2017, Mtoe



Source: State Statistics Committee, 2019

A comparison of 2017 energy consumption data regarding mode of transport and fuels (Figure 45) shows that 100% of petrol and 93% of diesel were used by road transport. The remaining diesel was used in domestic navigation (6%) and rail transport (1%). In terms of rail transport, diesel covered 23% of the sub-sector's needs, electricity 73% and other types of fuel 4%.

Figure 45: Energy consumption of the transport sector by mode (left) and by fuel (right), in 2017, Mtoe



Source: State Statistics Committee, 2019

During 2008–2017, the total number of registered vehicles in Azerbaijan increased by 56%, from 860,000 to 1,342,000 cars (Table 19).[148] The highest growth rate of 64% or 530,000 cars was among the passenger fleet. This resulted in an increase in the average number of private cars per thousand people from 80 to 117 over the last decade. At the same time, the number of buses only increased by 5% or by 2,700 compared to 2008, indicating the increased utilisation of private cars compared with road-based public transport.

Table 19: Number of vehicles depending on age, thousand vehicles

Type of vehicle	Total number	Less than 5 y.o.	5-10 y.o.	More than 10 y.o.
Passenger cars	1,147	103	214	831
%	100%	9	19	72
Buses	31	2	5	24
%	100%	6	17	77
Lorries	143	6	21	116
%	100%	4	14	83
Special purpose vehicles	11	1	3	7
%	100%	10	25	65
Total	**1,332**	**112**	**243**	**978**
%	***100%***	***9***	***18***	***75***

Source: State Statistics Committee, 2019

148 Transport of Azerbaijan, Statistical Yearbook, 2018, SSC.

Deeper analysis of the statistical data also shows that about 40% of private cars imported to Azerbaijan over the last decade were second-hand vehicles. In 2017, 75% of the vehicle fleet was older than 10 y.o. The highest shares of this indicator were for lorries (83%) and buses (77%), implying low fuel efficiency, a greater impact on the environment and high operational and maintenance costs compared with new cars.

Further analysis of the ratio of the number of the passengers transported by a type of transport to the total population (Table 20) also indicates that the greatest proportion of passengers travelled by road transport. The road transport ratio increased by 30% during 2010–2017 and the air ratio more than twofold. At the same time, the railway passenger flow ratio decreased by more than two times.

Table 20: Ratio of the number of the passengers transported by a type of transport to population in 2010–2017

	2010	2011	2012	2013	2014	2015	2016	2017
Railway	53.8	38.1	29.1	26.6	26.4	19.5	20.3	25.3
Aircraft transport	11.4	15.4	17.4	17.7	18.8	18.8	20.3	23.9
Sea transport	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2
Road transport	13,435.1	14,408.8	15,447.3	16,303.3	16,869.6	17,267.1	17,505.9	17,655.0

Source: State Statistics Committee, 2019

9.6.2.Assessment of Existing Energy Efficiency Potential

Two studies have estimated the EE potential of the country's transport sector:

- Energy Efficiency Orbits for Transition Economies, developed by the Center for Energy Efficiency (CENEf) and the Copenhagen Centre on Energy Efficiency (C2E2) in 2015;
- Nationally Appropriate Mitigation Actions (NAMAs) for low-carbon end-use sectors in Azerbaijan, a four-year project (2015–2019) funded by GEF, UNDP and SOCAR.[149]

The CENEf's estimate of the technical EE potential for transport is 0.88 Mtce (equivalent of 0.62 Mtoe)[150] or about 24% of the sector's annual energy consumption in 2013. Table 21 provides a breakdown of the CENEF's estimates, based on global practice. Nevertheless, the CENEf remarks that the data provided are subject to many assumptions and should be used mainly for indicative purposes.

149 The total budget of the NAMA is 35.47M USD, including GEF – 3.57, UNDP – 0.2M USD, SOCAR – 30.9 and MoENR – 0.8M USD, available at https://www.thegef.org/sites/default/files/project_documents/08-07-2014_ID5291_projdoc_0.pdf (accessed August 2019).

150 Energy Efficiency Orbits for Transition Economies, Center for Energy Efficiency (CENEf), Copenhagen Centre on Energy Efficiency (C2E2), available at http://www.cenef.ru/file/Final%20Report_C2E2_CENEf_June2_2015.pdf (accessed July 2019).

Table 21: Energy efficiency potential in transport in Azerbaijan as of 2013

Integrated technologies of goods, work, and services production	Units	Volume of economic activity	Units	Specific consumption in 2013	Practical minimum	Actual consumption abroad	Comments	Estimated technical potential, 1000 tce
Hybrid light vehicles	10^3 units	959	tce/vehicle/ year	1.3	0.76	0.88	Global practice	487.0
Hybrid buses	10^3 units	30	tce/vehicle/ year	7.7	4.62	7.10	Global practice	92.0
Hybrid freight vehicles	10^3 units	130	tce/vehicle/ year	5.8	3.47	5.64	Global practice	300.0
Total								878

Source: CENEf as quoted in C2E2, 2015

The CENEf's findings are only based on the substitution of the existing vehicle fleet with hybrid models and do not consider any other policy instruments or measures.

In December 2018, NAMA presented the key lessons learned, achievements and recommendations for a clean transport policy in Azerbaijan based on SOCAR's sustainable transport pilot.[151] The results presented were tested through a pilot project in SOCAR's fleet and included three components (Table 22).

In general, NAMA's recommendations related to the transport sector can be summarised as follows:

- To promote hybrid vehicles and plug-in hybrid vehicles as an intermediate step before promoting the overall electrification of road transport along with increasing RES share in electricity generation;
- To improve statistics on fuel efficiency of the existing fleet in order to develop a national renewal strategy;
- To introduce changes to the tax code and additional incentives to encourage users to buy cleaner vehicles;
- Introduction of compulsory targets on hybrid and electric vehicles for vehicle manufacturers and importers;
- Promote reforms in the public sector and state companies' fleets before targeting individual owners. Widen the practice of using eco-driving simulators for drivers from ministries and other state authorities;
- Promote eco-driving as one of the most cost-effective measures to reduce CO_2 emissions and to save fuel, especially using train-the-trainer workshops;
- Arrange campaigns to disseminate key eco-driving tips;
- Introduce eco-driving tips in driver's licence tests;
- Promote fleet management systems via governmental campaigns.

151 Presented in Baku in December 2018, available at https://www.undp.org/content/dam/azerbaijan/docs/Sustainable%20Energy/NAMA-workshop-presentations-5-6DEC2018/5.%20Cnf201812-TransportAAv4_revised%2004.12.2018.pdf (accessed August 2019).

Table 22: Lessons learned from SOCAR's sustainable transport pilot

Key facts	Lesson learned and achievements
Component 1: Clean vehicles	
• Barriers to electric vehicles: ◦ No dealers importing electric vehicles to Azerbaijan; ◦ More than 80% of electricity in Azerbaijan produced from fossil fuels; ◦ Deploying charging infrastructure will require huge investment and take a long time; • Project approach: to focus on hybrid vehicles;	• First hybrid vehicles imported to Azerbaijan have been successfully tested and have shown excellent performance; • 30% of fuel and emission savings compared to regular vehicles; • Fuel emissions savings compensate for higher costs of hybrid cars in 5.2 years.
Component 2: Eco-driving	
• No eco-driving questions in driver's licence tests in Azerbaijan; • 90 drivers attended workshops and almost 600 drivers trained with a simulator;	• Key eco-driving tips are easy to communicate and understand; • However, putting eco-driving tips into practice is difficult without some training; • A driving stimulator provides a cheaper option for workshop training, particularly for bus and truck drivers; • 18% of fuel and emissions savings for cars and relatively lower savings for buses and lorries.
Component 3: Fleet management	
• Fleet management system existed prior to the beginning of the project in 2015; • The existing system cannot provide information on fuel efficiency; • Installation of trackers to monitor speeding, high acceleration and deceleration is required;	• Fleet management system requires support from management and changes in the company's culture and practices; • Identification of relevant trackers and vehicles to participate in the pilot.

Source: NAMA, 2018

9.6.3. Existing Policies and Implementations

Strategic Road Map (SRM) on the Development of Logistics and Trade

The SRM on the Development of Logistics and Trade is one of the 12 Strategic Roadmaps that represent the strategic framework of the country (see Chapter 5.1). The document includes an action plan for 2016–2020, a long-term outlook by 2025 and a target vision beyond 2025. The document sets three main strategic targets, but none of them are related to EE or to the reduction of the environmental impacts of the transport sector.

Vehicle fuel efficiency

There are vehicle fuel efficiency standards for cars and vans in Azerbaijan, but only minimum toxic emissions standards for new and used vehicles imported to the country. From April 2014, all vehicles imported to Azerbaijan must meet Euro 4 requirements (see Chapter 5.2).

CO_2-linked import tax and purchase tax for vehicles

Currently, CO_2-linked import/purchase taxes are not applied in Azerbaijan. Such CO_2 import/purchase taxes could potentially constitute a revenue source for the Energy Efficiency Fund envisaged by the draft Law on EE. Such revenues to the Fund might be used

to help support the EE of the transport sector, while the transparency of hypothecating revenues can help to ensure the political acceptability of increasing citizens' tax burdens. Another way to ensure public support would be to introduce incentive payments, rebates or zero tax on the highest performing cars, as consumers are then presented with an attractive option and not all consumers would be penalised in the new tax scheme.

Taxation

Article 190 of the Tax Code envisages the excise rate for passenger cars and buses except buses operated with compressed natural gas (CNG) depending on the engine capacity class (Table 23). Though imperfect, engine size is a useful proxy for EE if vehicles are using similar powertrains and fuels.

Table 23: Excise rates for passenger cars and buses (from 1 January 2019)

Taxable items	Excise tax rate
Passenger cars	
Engine capacity up to 2,000 cm^3	0.30 manat for each cm^3
Engine capacity up to 3,000 cm^3	600 manat + 5 manat for each cm^3 between 2,001 and 3,000 cm^3
Engine capacity up to 4,000 cm^3	5,600 manat + 13 manat for each cm^3 between 3,001 and 4,000 cm^3
Engine capacity up to 5,000 cm^3	18,600 manat + 35 manat for each cm^3 between 4,001 and 5,000 cm^3
Engine capacity more than 5,000 cm^3	53 600 manat + 70 manat for each cm^3 more than 5,000 cm^3
Buses*	
Engine capacity up to 4,000 cm^3	Per each cm^3 of the engine capacity – 2 manat
Engine capacity up to 6,000 cm^3	8,000 manat + 4 manat for each cm^3 of the engine capacity between 4,001 to 6,000 cm^3
Engine capacity up to 8,000 cm^3	16,000 manat + 6 manat for each cm^3 of the engine capacity between 6,001 to 8,000 cm^3
Engine capacity up to 10,000 cm^3	28000 manat + 8 manat for each cubic centimetre of the engine capacity between 8,001 to 10,000 cm^3
Engine capacity exceeding 10,000 cm^3	44,000 manat + 10 manat for each cm^3 of the engine capacity exceeding 10,000 cm^3

** Except buses using CNG. If the production date of buses imported to the Republic of Azerbaijan exceeds 1 year or the lifetime mileage exceeds 100,000 km, excise duty shall be calculated by applying the coefficient 1.5.*

An example of a simple calculation based on the above table shows the excise duty for a passenger car with the following specifications:

- 1,600 cm^3 of engine capacity – 480 AZN (282 USD);
- 2,500 cm^3 – 3,100 AZN (1,824 USD);
- 4,000 cm^3 – 18,600 AZN (10,941 USD).

Therefore, this provides good incentives for a consumer to purchase a car with a smaller engine. However, there are few incentives to purchase cars with an engine capacity below 2,000 cm^3.

Smaller engines tend to consume less energy than larger engines, but within an engine capacity class there can be a range in EE performance depending on the technologies used and other factors, so a smaller engine is not always more energy-efficient than a larger one. According to international best practice, the promotion of energy-efficient vehicles is implemented by linking circulation/licence/import/purchase taxes or duties to the CO_2 emissions of the vehicle, as this is a useful proxy for the fuel economy of combustion engines powered by petrol and diesel and promotes cars with reduced CO_2 emissions.[152] It should also be noted that the excise duty is not applied to lorries and there are no tax incentives to buy newer cars compared with old and inefficient cars provided that an imported car meets Euro 4 requirements (see Chapter 5.2).

Excise duty is also not applied to battery electric vehicles. Since 1 January 2019, the import of battery electric vehicles has also been exempted from VAT.[153] The import of other types of vehicles, including hybrid electric cars, plug-in hybrid electric vehicles and motor vehicles, is subject to both the excise duty according to engine capacity (see Table 23) and 18% VAT.

Awareness raising

There is no publicly available information on awareness-raising programmes related to eco-driving, the promotion of public transport, bike sharing systems and so forth.

Other measures

"BakuBus" LLC has recently purchased and put into operation 300 new buses manufactured in France and operating using CNG. The new buses improve the comfort of public transport and help Baku city to reduce GHG emissions, as the carbon dioxide emissions released from CNG are significantly lower than other fuel types.[154]

Main Barriers Identified

Summarising the key findings and conclusions of this chapter, the following main barriers have been identified:

- There is a general lack of political interest and prioritisation in promoting EE measures in transport;
- Not fully cost-reflective prices remain part of the social policy of the country;
- There is no differentiation in the excise tax rate depending on the age of the car. There is also no tax incentive to buy cleaner cars;
- There is in general a lack of administrative capacity for the development of programmes or measures to promote cleaner-fuel vehicles;
- There are no fleet management strategies in state authorities;
- There are no incentives to promote the purchase of low-emissions vehicles (for both public and private sectors);
- There are no policy or programmes promoting inter-city travel using rail transport. A 50% decline in the use of railway transport since 2010 and an increase in road transport are the results of the wrong policy signals;

152 https://www.theicct.org/sites/default/files/publications/2017-Global-LDV-Standards-Update_ICCT-Report_23062017_vF.pdf (accessed June 2018).
153 According to Article 164 "Tax Exemption" of the Tax Code.
154 Second Biennial Update Report of the Republic of Azerbaijan to UN Framework Convention on Climate Change, Baku, 2018, available at https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/5427831_Azerbaijan-BUR2-1-Second%20Biennial%20Update%20Report%20-%20Azerbaijan-version%20for%20submission.docx (accessed August 2019).

- There is low awareness among decision makers and the wider population about eco-driving, proper vehicle maintenance and the use of alternative transport means;
- Eco-driving is not part of driving licence study and testing.

Recommendations: Transport

32. Assign clear responsibilities to a relevant governmental authority/department for the overall control and implementation of EE measures in the transport sector. Provide sufficient resources for managing such responsibilities (see Recommendation 3).
33. Introduce fleet management strategies in state authorities and state-owned companies;
34. Promote modal shift, in particular the use of public transport by improving its comfort, accessibility and affordability. Explore the cost benefits of adding new routes and creating dedicated road space for buses so that they can avoid traffic jams, particularly in tourist destinations. Promote sustainable transport, including subway and other electric means of public transport. Promote railway transport and an obligation for airport and airline companies to promote public transport travel to and from airports. Promote the use of bicycles, the development of specific bicycle lines and the use of electrical scooters.
35. Promote rail and maritime transport means for cargo transportation.
36. Explore options to restrict or influence vehicle imports to favour vehicles that are more fuel efficient and of lower emissions (i.e. hybrid, liquefied natural gas, liquefied petroleum gas), taking advantage of the improving fuel efficiency and emissions performance of the EU market.
37. Conduct targeted campaigns to promote measures related to behavioural changes, including eco-driving, car-sharing and proper vehicle maintenance. Introduce ecodriving as part of driver's licence study and tests.

Annexes

Annex 1: Installed Generating Capacities as of 2018

Power plants				
N	**Power plant**	**Operator and property type**	**Capacity, MW**	**Commissioning date**
Thermal power plants				
1.	Azerbaijan TPP	Azerenerji JSC State	2,400	1981–1990
2.	Janub CCPP	Azerenerji JSC State	780	1 July 2013
3.	Sumqayıt CCPP	Azerenerji JSC State	525	19 November 2009
4.	Shimal-1 CCPP	Azerenerji JSC State	400	29 November 2002
5.	Baku CHP	Azerenerji JSC State	107	19 October 2000
6.	Sangachal PP	Azerenerji JSC State	300	24 December 2008
7.	Baku PP	Azerenerji JSC State	104	22 February 2007
8.	Shahdağ PP	Azerenerji JSCState	104	19 September 2009
9.	Astara PP	Azerenerji JSC State	87	13 February 2006
10.	Sheki PP	Azerenerji JSC State	87	14 October 2006
11.	Xachmaz PP	Azerenerji JSC State	87	7 December 2006
12.	Lerik PP	Azerenerji JSC State	16,5	15 October 2018
13.	Nakhichevan PP	Nakhichevan AR State	87	20 December 2006
14.	Nakhichevan TPP	Nakhichevan AR State	64	1992
	Shimal 2 CCPP	Azerenerji JSC State	409 (not put into operation)	
	Shirvan TPP	Azerenerji JSC State	900 (obsolete, taken out of operation)	1962
Total :			5148.5 Azerenerji JSC – 4,997.5 Nakhichevan AR – 151	
Large hydro power plants				
1.	Mingachevir HPP	Azerenerji JSC State	424	1955; 2018 – modernisation
2.	Shamkir HPP	Azerenerji JSC State	380	1983
3.	Yenikend HPP	Azerenerji JSC State	150	2003
4.	Fuzuli HPP	Azerenerji JSC State	25	15 December 2012
5.	Taxtakorpü HPP	Azerenerji JSC State	25	28 September 2013
6.	Shamkirchay HPP	Azerenerji JSC State	25	15 November 2014
7.	Varvara HPP	Azerenerji JSC State	18	1957
8.	Araz HPP	Nakhichevan AR State	22	1971
9.	Arpachay-1 HPP	Nakhichevan AR State	20.5	7 April 2014
10.	Bilav HPP	Nakhichevan AR State	20	3 October 2010
Total :			1109.5 Azerenerji JSC – 1,047 Nakhichevan AR – 62.5	

N	Power plant	Operator and property type	Capacity, MW	Commissioning date
Small hydro power plants				
1.	Göychay SHPP	Azerenerji JSC State	3.1	6 October 2015
2.	İsmayıllı -1 SHPP	Azerenerji JSC State	1.6	14 August 2013
3.	İsmayıllı -2 SHPP	Azerenerji JSC State	1.6	16 August 2016
4.	Balakən -1 SHPP	Azerenerji JSC State	1.5	3 August 2017
5.	Qusar-1 SHPP	Azerenerji JSC State	1.0	20 December 2012
6.	Vayxır HPP	Nakhichevan AR State	5.0	20 December 2006
7.	Arpachay – 2 SHPP	Nakhichevan AR State	1.4	7 April 2014
8.	Chichəkli SHPP	"İnterenerji" JSC Private	3	1927/19 August 2017 rehabilitation
9.	Mugan SHPP	Messenat Holding Private	4.05	2004
10.	Sheki SHPP	Şəki ASC, özəl SAARES State	1.88 (1.3+0.58)	1936 2008 – modernisation
11.	Nugedi SHPP	Private	0.83	
	Astara-1 SHPP (construction started in 2011, but not yet completed)	Azerenerji JSC State	1.7	15 October 2018 connected to the network
Total:			24.96 Azerenerji JSC – 8.8 Nakhichevan AR – 6.4 Private – 9.18 ABEMDA – 0.58	
Total on Hydro:			1,134.46 Azerenerji JSC – 1,055.8 Nakhichevan AR – 68.9 Private l – 9.18 ABEMDA – 0.58	
Wind power plants				
1.	Yeni Yashma Wind Power Park	Azerishig JSC State	50	11 October 2018
2.	Yashma Bagları Wind Power Park	Azerishig JSC State	3.6	2019
3.	Şurabad Wind Power Park	Azerishig JSC State	1.7	2019
4.	Hokmali WPP	Alten Group Private	8	2011
5.	Gobustan WPP (hybrid)	SAARES State	2.7	13 September 2011
6.	Ecology Park	SOCAR State	0.04	2010
Total :			66.04 Azerishıg JSC – 55.3 ABEMDA – 2.7 SOCAR – 0.04 Private – 8	

N	Power plant	Operator and property type	Capacity, MW	Commissioning date
Solar power plants				
1.	Nahkichevan SPP	Nakhichevan AR State	24 (20+2+2)	1 December 2015 8 September 2017 2 February 2019
2.	Gobustan SPP (hybrid)	SAARES State	3.0 – constructed 0.992 – connected to the network 4.0 – design capacity	13 September 2011
3.	Suraxanı SPP	SAARES State	1.56 / 1.4 (2.8 design)	16 June 2014
4.	Pirallahı SPP	SAARES State	1.10 / 0.48 (2.8 design)	21 July 2017
5.	Samux SPP	SAARES State	2.8 / 1.5 (2.8 design)	19 August 2017
6.	Sahil SPP	SAARES State	1.93 / 1.44 (2.8 design)	30 January 2018
7.	Sumqayıt GES	SAARES State	2.17 (2.8 design capacity)	Not connected to the network
8.	Social facilities	SAARES State	0.585	
9.	Ecology Park	SOCAR State	0.02	2010
			37.165 Nakhichevan AR – 24 SAARES – 13.145 SOCAR – 0.02	
Bioenergy power plants				
1.	Gobustan bioqaz facility (hybrid)	SAARES State	1	13 September 2011
2.	Waste-to-Energy Plant	Temiz Sheher JSC State	37	19 December 2012
Total:			38	
1.	BP Azerbaijan	BP and partners Private	556.1	
2.	SOCAR	SOCAR State	133.7	
3.	Azerbaijan Sugar Production Company Ltd. (Azərsun Holdinq)	Azersun Holding Private	24.0	
4.	Azerbaijan Sugar Production Company Ltd. (Azersun Holding)	Azersun Holdinq Private	8.6	
Total			722.4	

Source: Energy Charter Secretariat based on Azerenerji, 2019 & Ministry of Energy, 2019

Annex 2: Capacity Utilisation Factor of Azerenerji's Power Plants in 2014–2017, %

No	Power plant	Installed capacity	Capacity utilisation factor			
			2014	2015	2016	2017
		MW	%	%	%	%
	Thermal power plants	**4,925**	**47**	**46**	**46**	**45**
	Conventional TPP	**2,400**	**41**	**38**	**33**	**40**
1	Azerbaijan TPP	2,400	35	34	31	37
2	Shirvan TT*	900	16	12	7	7
	Combined-cycle power plants	**1,650**	**59**	**61**	**67**	**56**
3	Sumgayit CCPP	525	55	65	71	70
4	Shimal CCPP	400	52	61	62	59
5	Janub CCPP	725	65	57	68	43
	Combined heat and power plants	**107**	**63**	**34**	**47**	**40**
6	Baku CHP	107	63	34	47	40
	Gas motor power plants	**768**	**37**	**42**	**38**	**40**
7	Astara GMPP	87	29	28	23	26
8	Baku GMPP	104	50	57	52	54
9	Khachmaz GMPP	87	33	36	29	32
10	Sangachal GMPP	299	34	46	44	45
11	Shahdag GMPP	104	45	37	37	42
12	Sheki GMPP	87	35	35	29	28
	Hydro power plants	**1,054.7**	**12**	**16**	**19**	**17**
13	Mingechavir PP	424.6	9	12	15	15
14	Shamkir HPP	380	16	20	22	17
15	Enikend HPP	150	18	21	21	16
16	Varvara HPP	17	0	0	3	62
17	Fizuli HPP	25	15	17	17	17
18	Tahtakorpy HPP	25	1	15	24	31
19	Shamkirchay HPP	24.4	0	1	22	21
20	Small HPP (6 plants)	9	9	8	10	9
	Total	**5,979.7**	**41**	**41**	**41**	**40**

** The old and obsolete Shirvan TPP is presented in this table, but not counted for total installed capacity*

Source: Energy Charter Secretariat based on Ministry of Energy of Azerbaijan, 2019

Annex 3: Recently Completed Energy Sector Projects Supported by Donor Organisations in Azerbaijan

Project	Results/Status
EU/EU4Energy	
• Support for the development of a long-term energy strategy The TA included: gap analysis and assessment of the existing strategic, institutional and legal framework in the energy sector; assessment and gap analysis of energy and other data availability; proposed design and outline of the long-term energy strategy; definition of the strategy timeframe; identification of strategic goals in consultation with relevant energy stakeholders in Azerbaijan; detailed roadmap/plan for the development of an energy strategy	Roadmap was introduced to stakeholders in December 2018.
• Draft Law on Efficient Use of Energy Resources and Energy Effectiveness (Law on EE) The Law covers: Energy efficiency in buildings; energy efficiency in industry; energy audit; energy management systems; standardisation, certification, accreditation; energy efficiency fund; energy labelling	Final draft law was introduced to the public (Working Group, related state authorities, NGO, universities) in March 2018. Now under revision by the President's Administration
EU/TAIEX	
• Workshop on preparation of energy tariff methodologies	4-5 October 2018. Excelsior Hotel
• Expert Mission on Energy Audit and Energy Management Systems	22-23 November 2018. Ministry of Energy
• Workshop on Energy Market Concept, Design and Operation The aim of the proposed workshops and expert mission was to share best practices of European experience (both from EU member states and the Energy Community Contracting Parties) on the abovementioned topics.	14-15 January 2019. Excelsior Hotel
ADB	
• Preparing an enabling environment for PSP in Azerbaijan's power sector, phase 2. Two pilot projects (Khachmaz Modular Power Station, Surakhani Solar Power Station) were studied by consultants as to the pros and cons of introducing PSP in the power sector of Azerbaijan.	Final report was presented to the Working Group members (stakeholders) in June 2018. As a result of the analysis, Khachmaz Station did not appear viable for PSI investment, but Surakhani Station was assumed as an attractive project for private investors if its capacity could be enlarged to minimum 20 MW.
• Preparing a power sector Financial Recovery Plan (Phase 1) The main objective of the project is to establish an appropriate electricity tariff mechanism along with supportive policies, rules and regulations to help the power sector achieve full cost recovery by 2022.	Final report was submitted in May 2018.
USAID	
• Draft Law on Electricity Market The draft law was prepared by international consultants in accordance with EU energy policy.	Draft law was introduced to the stakeholders in January, 2018
STATE BUDGET	
• Preparation of action plan for the optimisation and improvement of existing power plants The project's objective was the preparation of a programme for major power plants to be implemented in a short to medium perspective and to provide indicative information related to the required budget, timeframe and economic benefit.	Action plan was submitted by the consultant in 2018.

Source: Ministry of Energy, 2019

Annex 4: Ongoing Energy Sector Projects Supported by Donor Organisations in Azerbaijan

EU/EU4Energy
• **Support for the development of a long-term energy strategy** In 2018, the EU4Energy project contributed to the development of a gap analysis of Azerbaijan energy sector-related strategic commitments and documents, including the publicly available Strategic RoadMaps. Furthermore, following broad stakeholder consultations, EU4Energy provided a detailed proposed structure as well as a roadmap for the development of a long-term energy strategy. The TA aims to develop and present a draft long-term Energy Strategy of Azerbaijan.
• **Preparation of the National Action Plan on Energy Efficiency (NEEAP)** - Development of NEEAP structure (based on EU best practices) for Azerbaijan and establishment of an indicative target for Azerbaijan based on comprehensive energy data, indicators and statistics for the last five years; - Sectoral measure selection and design, estimation of energy saving and targets, necessary financing of the measures; - Propose institutional responsibilities and Monitoring and evaluation system; - Development of a comprehensive National Action Plan for the efficient use of energy resources of Azerbaijan, including financial needs and sources.
• **Accelerating the development of energy labelling and ecodesign requirements for energy-using products** - Building capacity for introducing ecodesign and labelling requirements in Azerbaijan based on best EU practices; - Draft roadmap for the development of ecodesign and labelling requirements, including deadlines and institutional responsibilities.
ADB
• **Preparing a power sector Financial Recovery Plan (Phase 2)** The TA aims to prepare a tariff methodology on electricity. Consultants work closely with the Azerbaijan Energy Regulatory Agency (AERA). The project seeks to be finalized in November 2019.
• **Floating Solar Energy Development** The TA is being implemented in three countries: Azerbaijan, Afghanistan and the Kyrgyz Republic. The main objectives are the construction of a floating solar PV plant with a capacity of 100 kW in each country, capacity building including study tours to leading FPV countries, support countries to enhance their knowledge and technical skills in designing, constructing and operating floating solar PV plants.
EBRD
The projects are being implemented according to the "Letter of Intent", signed between EBRD and MoE in September 2017.
• **Support for the establishment of an independent energy regulator in the Republic of Azerbaijan (including draft law on regulator)** The project includes the development of primary legislation (Law on Energy Regulator), capacity building and institutional development programme.
• **Action Plan for Power Grid Strengthening to Support RES Projects** The main purpose of the TA is to conduct a technical review and analysis of the existing situation of the transmission and distribution networks and to prepare an action plan, including the necessary measures and investments, which will allow the smooth integration of intermittent RES projects.

• Assist with the design and implementation of the competitive bidding process for RE The main objectives of the TA are: - Develop the high-level design of the competitive procurement scheme for supporting RE; - Develop all of the documentation required for the first round(s) of auctions for RE (i.e. the request for proposal (RfP) package); - Provide implementation support to the auction administrator for the first round(s) of auctions for RE.
• Assist with developing the legal and regulatory framework to support small-scale RE The TA aims to identify gaps and barriers in the legislative, regulatory and contractual arrangements for small-scale RE technological development; identify a model framework based on international experience that leverages on ongoing market development; draft the legislative framework for small-scale renewable energy technologies in the Republic of Azerbaijan.
STATE BUDGET
• Assistance to the Ministry of Energy in developing a framework and legislation to promote renewable energy The project provides preparation of the below documents: - Draft Law on the Use of Renewable Energy for Electricity Production - Power purchase agreement template - Connection agreement template
• Development of a comprehensive legal framework on reforms aimed at the formation of market principles and market participants in the electricity sector Draft Law on Electricity was revised and submitted to the Cabinet of Ministers. In addition, an Energy System Transition model has been prepared and reflected in the draft law.
• Diagnostics of technical and operational conditions and performance of the state-owned heat company Azeristiliktajhizat OJSC. - The project's objective is to diagnose all of the performance indicators of the abovementioned company and to prepare an action plan that will include heat production and distribution, management and administrative actions and a strategic approach regarding the country's heat supply.

Source: Ministry of Energy, 2019

Annex 5: Programme of the Peer Review Mission to the Republic of Azerbaijan

Time	Venue	Participants (including the representatives of the IMWG)	Discussion topic
Day 1 (Monday, 16 September)			
9:00-11:00	Ministry of Energy (MoEn, Heydar Aliyev avenue 152, Chinar Plaza)	Ministry of Energy (Departments of EE and RES, Power Engineering, Economy, Legal, Oil and Gas)	Greeting speeches Overall energy policy in AZ EE and RES policy in AZ energy efficiency potential in economic sectors
11.00 -13.00		Energy Regulatory Agency Tariff Council	Reforms in the energy sector, tariff policy, RES policy
14:00- 17:00		Azerigaz Azerenerji Azerishig Azeristiliktechizat	Existing and planned measures for increasing EE in generation, transmission and distribution of natural gas, electricity and heat
Day 2 (Tuesday, 17 September)			
9:00-11:00	Ministry of Energy (MoEn, Heydar Aliyev avenue 152, Chinar Plaza)	Ministry of Economy	Energy efficiency potential in industry and energy-using products
9:00-13:00		Ministry of Ecology and Natural Resources	Environmental and climate change policies related to energy
14.00-15.00		Ministry of Transport, Communications and High Technologies	Energy efficiency potential in transport sector
15.00-16.00		State Committee of Urban Development and Architecture	Energy efficiency potential in buildings
16:00-17:00		Ministry of Agriculture	Energy efficiency potential in agricultural sector
Day 3 (Wednesday, 18 September)			
9:00-13:00	Delegation of the EU to Azerbaijan (11th floor, 90A Nizami St. Landmark III)	Meeting with donors: ADB, EBRD, USAID, UNDP etc. MoEn	Support for the development of the energy sector and investment in energy efficiency
14.00-16.00	Hotel's meeting room	Ministry of Energy	Discussion of findings and draft recommendations
Day 4 (Thursday, 19 September)			
9:00-13:00	Hotel's meeting room	Inter-Ministerial Working Group (IMWG) meeting on the Development of the NEEAP	Presentation of NEEAP development and implementation in Energy Charter Treaty (ECT) member countries
14:00-16:00	Hotel's meeting room	Ministry of Energy	Final provision, discussion of conclusions and recommendations

Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects
PEEREA

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