SECTOR ASSESSMENT (SUMMARY): ENERGY

Sector Road Map

A. Sector Performance, Problems, and Opportunities

1. Azerbaijan is rich in energy resources. The overall volume of the country’s hydrocarbon reserves is an estimated 7 trillion barrels of oil equivalent. Azerbaijan is one of the world’s oldest oil producing regions. Oil production dominates in the country’s economy, with about 43 million tons of oil produced annually. Oil and gas are the primary sources of energy and the main export products.

2. The energy sector plays a central role in the economy, typically contributing over 50% of the country’s gross domestic product (GDP), making it the economy’s largest segment. Economic growth rests in large part with the successful development of its oil and natural gas resources and through effective management of the resulting revenue stream. Although production from the State Oil Company of the Azerbaijan Republic (SOCAR) is in decline, foreign direct investment has revitalized the country’s oil sector through the development of new large-scale projects and the refurbishment of existing facilities.

3. Azerbaijan has natural gas reserves of 48 trillion cubic feet and an extensive gas network. Gas supplies come from SOCAR’s own gas production; associated gas produced under the Azeri, Chirag, Guneshli production sharing agreement; and imports from the Russian Federation. With higher economic growth as well as the country’s efforts to improve energy efficiency by converting oil-fired power plants to gas-fired ones, demand for domestic natural gas is growing. The sector infrastructure, however, has suffered from lack of investment and limited maintenance.

4. The power sector, along with the oil and gas sector, plays a leading role in Azerbaijan’s social and economic growth. Since 2009, large investments in power generation and transmission facilities have resulted in remarkable improvements in the quality of power supply. At present, electricity production is sufficient to cover domestic demand and allow the surplus to be exported to neighboring countries, including Georgia, the Russian Federation, and Turkey. The power supply system is capable of delivering electricity of acceptable quality to almost the entire population.

5. The power sector is vertically integrated. Azerenerji Joint Stock Company (Azerenerji) is the state-owned enterprise responsible for the operation and management of major thermal and hydropower generation plants, transmission and distribution networks, and commercial transactions (connections, end customer metering, billing, bill collection, and customer services) in the country except in Baku and Nakhchivan, which are covered by other agencies. Azerenerji’s total electricity production in 2013 reached 20,786.8 million kilowatts (kWh), of which 93.9% was generated from thermal power and 6.1% from hydropower. Private sector investments in the generation facilities account for about 1% of the total installed capacity.

6. Azerbaijan adopted the State Program for the Development of the Fuel and Energy Sector, 2005–2015, which includes a series of reforms. Key measures include (i) promoting

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1 This summary is based on various Asian Development Bank (ADB) technical assistance reports and consultations with relevant government agencies and other stakeholders.

2 Estimated by BP.
increased private participation in the provision of utility services; (ii) implementing the medium-term tariff policy with a transition to full cost recovery for utility service providers; (iii) adopting the new accounting standards in line with International Financial Reporting Standards (IFRS), which are required for all state-owned utilities; (iv) creating a regulatory environment by strengthening the Tariff Council; and (v) strengthening competition under a new competition law.

7. However, the situation requires continuing efforts for improving the adequacy and quality of energy supply. The key challenge facing the energy sector is the need to optimize energy utilization efficiency in an economically sustainable and environment-friendly manner, and to provide adequate and reliable energy supply throughout the country. Reliable power supply throughout the country and sustainable use of energy are paramount to foster inclusive economic growth. Key efforts to be pursued in the energy sector are summarized below.

8. **Improving generation efficiency.** Over 20% of all power plant equipment is well beyond its useful life. The total available capacity of generation plants in 2010 was 54% of their installed capacity, and the efficiency of some plants is as low as 25%. With the completion of new state-of-the-art combined cycle gas turbine generation units by around 2016, old and less efficient generation units will be decommissioned, including the disposal of decommissioned equipment, and the overall generation availability will rise to 75%.

9. **Rehabilitating transmission and distribution networks.** Azerbaijan is at the center of the trans-Caucasus interconnected power system. The long distance between its generation and load centers requires a backbone of large transmission lines for energy transport. The majority of power transmission and distribution facilities in districts are old, having been in operation for 30 years and more. The equipment has reached the end of its service life and has become less reliable, with more frequent outages occurring and increasing losses. The overall distribution system losses at voltage levels below 35 kilovolts (kV) is about 15%. The unserved energy from network outages is estimated to amount to 15% of annual sales.

10. **Improving collection.** Azerenerji supplies electricity to about 1.45 million customers, 60% of which are residential. Collection rates from residential customers were poor from 2006 to 2008, with an average rate of 50%. In 2007, Azerenerji initiated the installation of meters, including prepayment smart meters. This has resulted in much-improved collection—from an average of 38% in 2006 to nearly 88% in 2013. It has also raised public awareness on electricity consumption and has broadened perceptions on energy savings.

11. **Improving financial performance.** The financial performance of energy utilities is weak. Each year, Azerenerji receives government budget support to implement part of its capital expenditure program. To enhance its operational and financial performance, Azerenerji is undertaking various actions including (i) rehabilitating the regional distribution network to reduce technical losses and operational costs; (ii) installing prepaid meters in all residential customers; (iii) expanding power exports to Georgia, Turkey, and the Russian Federation; (iv) taking further steps in the corporatization process, including the introduction of enterprise resource planning, enhancing internal audit and control, and budgeting and planning functions; and (v) attempting to obtain a corporate credit rating and diversifying its financing channels.

12. **Eliminating cross-subsidy.** The gas used in power generation is heavily subsidized by the government. The amount of this subsidy has been conservatively estimated at about

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3 The electricity tariff was increased three-fold in January 2007 from $0.024/kWh to $0.075/kWh, which covers operational costs.
$650 million per year. Azerenerji is considering the use of its surplus energy to increase its exports of electricity to Turkey and other neighboring countries to enhance its financial position. While this policy will be of benefit to Azerenerji, this policy is potentially adverse to the interests of the Azerbaijan economy. With adequate investments in distribution networks and continued corporate reform, Azerenerji should be in a position to improve its operational efficiency and governance, and obtain greater financial benefits without the government subsidies. The cross-subsidy is expected to be eliminated gradually, and the sector should be more transparent and auditable.

13. **Diversifying energy supplies.** Large, natural potential exists for renewable energy development in Azerbaijan, mainly in sun, wind, and small hydropower. The sector's potential is being utilized and significant activities are being implemented to improve the sector. The obstacles to more active utilization of renewable energies are lack of (i) a strong institutional and regulatory framework to support renewable energy, (ii) a renewable feed-in tariff mechanism and a fund to support up-front investment, and (iii) technical capability. With support from the government and international development partners, renewable energy development in Azerbaijan is progressing.

**B. Government’s Sector Strategy**

14. The overall vision of the government’s energy sector strategy is to utilize domestic energy resources efficiently, protect the country's energy security, and ensure the delivery of reliable and adequate energy services throughout the country for sustainable economic growth. The energy sector policy framework features the following: (i) promoting efficient use of energy resources and increasing sector operation efficiency; (ii) establishing a sound regulatory environment to promote competition; (iii) improving the sector structure to attract more investments; (iv) promoting renewable energy and sustainable development to ensure environmental safety; (v) strengthening financial discipline in the sector and ensuring full payment for energy consumption; and (vi) increasing the share of renewable energy (sun, wind and biogas) in power generation. Energy also plays a prominent role in the government's Azerbaijan 2020 vision, with a focus on renewable energy and energy efficiency.\(^4\)

15. To achieve the vision of long-term development, the following main goals have been identified: (i) ensuring that power needs are fully met; (ii) implementation of a tariff transition plan, including the elimination of hidden subsidies and more transparency in tariff setting; (iii) improving the efficiency of operations and promoting financial and operational transparency; (iv) promoting energy efficiency and alternative energy technologies; and (v) encouraging private sector participation.

C. **ADB’s Sector Experience and Assistance Program**

16. **ADB operations.** The energy sector is identified as a priority area for Asian Development Bank (ADB) operations. ADB’s engagement in Azerbaijan’s energy sector began in 2006 to support renewable energy development. ADB provided a technical assistance project that developed an action plan to boost renewable energy development and designed small hydropower pilot projects, which are under implementation by the government. The first ADB loan of $160 million to the energy sector was provided in 2008 for the power transmission enhancement project.

\(^4\) Azerbaijan 2020: Look into the Future (accessible from the list of linked documents in Appendix 2).
17. **ADB’s sector strategy.** ADB’s *Strategy 2020* and the Midterm Review of Strategy 2020 have identified infrastructure development as a core area of operation. In the energy sector, emphasis is placed on (i) expanding the supply of clean energy; (ii) promoting energy efficiency through supply- and demand-side measures; and (iii) removing policy, institutional, and regulatory barriers for efficient energy use. In particular, *Strategy 2020* notes that ADB will support developing member countries to move their economies onto low-carbon growth paths by improving energy efficiency, expanding the use of clean energy sources, and reducing greenhouse gas emissions. ADB’s *Energy Policy* (2009) prioritizes promoting energy efficiency and renewable energy as one of three pillars of ADB’s assistance in the energy sector.⁵

18. ADB assistance for Azerbaijan will prioritize infrastructure projects that address critical gaps and constraints in the overstressed power systems, and projects that rehabilitate and modernize the power infrastructure. Priority areas include the following:

- **Energy efficiency and renewable energy development.** ADB will support the government’s efforts in renewable energy development and explore opportunities in energy efficiency, renewable energy, and adaptation to climate change.

- **Rehabilitation of power transmission and distribution networks.** ADB will continue to support distribution enhancement investment programs.

- **Facilitating regional power trade and cooperation.** ADB will continue to support cross-border transmission connectivity and power trade with neighboring countries through the Central Asia Regional Economic Cooperation (CAREC) Program.

- **Policy and institutional reform.** ADB will collaborate with other development partners and support policy and institutional reforms aimed at establishing a tariff regime and creating a sound regulatory environment to promote competition and attract private sector investment.

- **Capacity development.** Areas identified for capacity development include (i) long-term corporate planning, (ii) project appraisal, (iii) project management and supervision, (iv) financial management, (v) human resources management, and (vi) environmental and social safeguards.

19. ADB will continue to use innovative financing instruments such as credit risks sharing to reduce financing costs, and alternative procurement models such as public–private partnerships with commercial lenders to mobilize adequate financial resources and reduce the high investment costs. Public sector interventions will be closely coordinated with those supported by ADB’s Private Sector Operations Department.

20. Opportunities for improving gender integration in ADB’s investments in the sector are as follows:

- **Develop public communication strategies in which women are trained and paid as change agents to promote energy efficiency (e.g., usage of energy saving appliances).**

- **Develop consumer feedback mechanisms where women can voice their concerns and receive immediate responses.**

- **Increase women’s employment and career opportunities in the energy sector.**

- **Ensure quality and continuity of power supply to households, particularly in peri-urban and rural areas, to support small business and access to information.**

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Problem Tree for Energy

EFFECTS

Unsustainable economic growth
Inefficient utilization of domestic energy resources
Affected households use of electricity

CORE PROBLEM

Unreliable and inadequate energy supply

CAUSES

Physical

Non-Physical

Poor and inadequate physical Infrastructure
Insufficient investment and financing
Weak institutional capacity
Inappropriate planning, and policy and regulatory constraints

Aging assets underperforming
Limited power trade with neighboring countries
Insufficient financing resources
Insufficient private participation
Limited human resources and business experience

Limited transmission capacity
Slow progress on renewable energy development
Insufficient financing
Insufficient private participation
Limited staff strengthen and lacking training

Deteriorated distribution networks
Obsolete technology in system design
Poor bill collection and cost recovery
Limited corporate governance

Limited legal and regulatory framework

Interventions

Public investments on generation, transmission, renewable energy facilities ongoing
Financing support from ADB, World Bank, KfW, EBRD, JICA, IsDB
Capacity building programs supported from ADB, EU, KfW and JICA

Power sector master plan and road map prepared with support from ADB and JICA. Development partners’ consolidated policy dialogue ongoing.

### Sector Results Framework (Energy, 2014–2018)

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<th>Country Sector Outcomes</th>
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<td>Outputs with ADB Contribution</td>
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<td>Planned key activity areas</td>
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<td>Increased and more efficient use of energy resources, including renewable energy</td>
<td>Electricity service usage increased to 99.9% of the population by 2020 (2011 baseline: 85%)</td>
<td>Power supply system expanded, improved, and well managed</td>
<td>Renewable energy generation capacity increased to 1.250 MW by 2020 (2011 baseline: 950 MW)</td>
<td>Distribution network rehabilitated and commissioned (91% of lending in the sector)</td>
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<td>Electricity consumption per capita increased to 2,500 kWh by 2018 (2011 baseline: 1,650 kWh)</td>
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<td>1.500 km of additional transmission lines installed by 2020 (2011 baseline: 2,700 km)</td>
<td>Renewable energy development (9% of lending in the sector)</td>
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<td>Total revenue from electricity sales increased to $900 million by 2018 (2011 baseline: $862 million)</td>
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<td>About 45,000 km of additional distribution lines installed and upgraded by 2020 (2011 baseline: 130,000 km)</td>
<td>Pipeline projects with estimated amounts</td>
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<td>CO₂ emissions (tCO₂ per year) reduced by 24,000 tons per year by 2020 (2011 baseline: 0)</td>
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<td>Electricity bill collection efficiencies increased to 100% by 2020 (2011 baseline: 70%)</td>
<td>Power Distribution Project ($100 million)</td>
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<td>Power interruptions (unplanned) reduced to once per year in 2018 (2011 baseline: average of 8 times per year)</td>
<td>Renewable Energy Development (Biomass Cogeneration) Project ($40 million)</td>
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<td>Technical and non-technical losses in the transmission and distribution sector reduced to 11% by 2018 (2011 baseline: 27%)</td>
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**ADB =** Asian Development Bank, **CO₂ =** carbon dioxide, **km =** kilometer, **kV =** kilovolt, **kWh =** kilowatt-hour, **MFF =** multitranche financing facility, **MVA =** megavolt-ampere, **MW =** megawatt, **tCO₂ =** tons of carbon dioxide.  
**Source:** ADB staff estimates.