AZERBAIJAN ECONOMY AND POWER SECTOR: CHALLENGES AND OPPORTUNITIES

1. Analysis

1. Economy. The economy grew, on average, by 29.3% from 2005-2007 and in 2008, the gross domestic product (GDP) increased by 10.8% despite the global economic downturn and geopolitical conditions. Net exports fueled by new oil and gas production remained the major driver of growth. The Government has substantially improved trade and investment conditions in an effort to spur private sector development, particularly in the non-oil segment. The Government aims to optimize energy efficiency to preserve resources for potential export.

2. On the production side growth was lead by construction, services and agriculture. Non-oil GDP grew at almost 16%, the highest in 5 years. Consumer price inflation accelerated to an average of 20.8% from 16.7% in 2008. Price of food which weighs on over 30% of the basket was the main cause. Overall, the economy was boosted by large-scale public investment in infrastructure. Public investment focused on social sectors (health, education) and improvement of public utilities (electricity, heating, water supply and sanitation).

3. Energy sector. The Azeri Chirag-Guneshli offshore oil is exported to the Western markets through the Baku-Tbilisi-Ceyhan pipeline.1 Shah Deniz gas field is located 70 km off the coast from Baku and average production 8.4 billion cubic meters per annum and exported via the South Caucasus Gas Pipeline to Turkey.2 Azerbaijan is rich in diverse and abundant energy resources. The overall volume of the country’s hydrocarbon reserves is an estimated 7 trillion barrels of oil equivalent, while the natural gas reserves are 1.2 trillion cubic meters. Oil production dominates in the country’s economy, with 50 million tons of oil produced annually.

4. The power sector, along with the oil sector, plays a leading role in Azerbaijan’s social and economic growth. The energy sector plays a central role in the economy, contributing to one third of the country’s GDP in 2008, making it the economy’s largest segment. The development of the power sector has been one of the Government priorities.3

5. The electricity production of Azerbaijan in 2008 was 20,722 gigawatt-hours (GWh), of which 18,575 GWh (90% of total) was generated from thermal power and 2,147 GWh (10% of total) from hydropower. In 2008, about 142 GWh of electricity energy was imported from abroad which is a significant decrease from 548 GWh in 2007. The total export electricity energy to Iran Georgia and Russia was 668 GWh. The total domestic electricity consumption in 2008 was 19,343 GWh. The average growth rate of domestic electricity demand is expected to be around 4.7% annually through to 2015.

6. Azerenerji Open-Joint Stock Company (AzerEnergy) is the state-owned enterprise (SOE) responsible for operation and management of major thermal and hydropower generation plants, distribution and high-voltage transmission network. Among the total installed generation

---

1 The 1,768 km pipeline carries 1 million barrels of oil per day from the off-shore oil field to Baku through Georgia to Ceyhan a port on the south-eastern Mediterranean coast of Turkey. The first tanker export of crude oil which travelled through the line was on 4 June 2006.

2 The 692 km gal pipeline follows the route of the Baku-Tbilisi-Ceyhan pipeline but links to the Turkish gas distribution system. The pipeline is capable of carrying 7 billion cubic meters of gas and delivery of gas to Turkey commenced on 30 September 2006.

3 State Program of Development of Energy (President's decree No. 635 dated 14 February 2005) and the State Program of Social Economic Development of Regions for 2009-2013).
capacity in Azerbaijan which reaches 6,200 megawatts (MW) in 2008, AzerEnergy owns 98.5%, including 11 thermal power plants (3,956 MW), 4 hydro power plants (1,018 MW) and 5 modular power plants (452 MW). AzerEnergy, with the support of the Government, has been replacing and refurbishing old fuel inefficient plants since 2000 and 32% of the plants are running at optimal capacity. Shirvan and Azerbaijanskaya conventional steam cycled gas fired power plant make up 57% of available capacity but run at 12% and 24% below installed capacity. The power transmission and distribution grid consists of substations and transmission lines at the voltages from 400 volt (V) to 500 kilovolt (kV), with a total length of 110,000 km. It has an extensive power transmission system connected to those of its neighbors, which allows import and export of power from and to Russia, Turkey, Georgia, and Iran. AzerEnergy aims to become an international company applying state of the art technology as well as international safeguard standards.

2. Challenges

7. The domestic power sector is threatened by unreliable and inadequate power supply mainly due to deterioration of power facilities, inadequate maintenance and rehabilitation, inadequate investment, and inefficient utilization of energy resources. This undermines industrial competitiveness and constrains economic growth. Effective generation capacity has shrunk due to insufficient funds for rehabilitation and capacity addition especially in the 1990’s. Improvements have been made since 2000, however, low power plant efficiency and high losses of transmission and distribution still plague the system. The lack of efficiency leads to wastage of hydrocarbon resources that could have been exported, and nearly doubles the emissions of greenhouse gas and other pollutants that damage the regional and global environment. While the country has been successful in engaging the private sector for developing and exporting its oil and gas resources, private sector investment into the power sector has been limited.

8. Insufficient and Unreliable Power Supply. Today, around 49% of the Azerbaijan’s 8.5 million people live in rural areas, often with insufficient access to quality basic services. Lack of sufficient power, gas, and heat has aggravated the regional imbalance in the country. Poor-quality and unreliable electricity supply inhibits industrial, agriculture and commercial activities, thus constraining economic growth and employment opportunities in regional areas. The unreliability of electricity supply remains a constraint to business operation and daily life. Almost 7% of total annual sales were lost due to power outages. Some areas of the country receive only a few hours of electricity a day, and there are frequent localized outages and occasional widespread system failures. Detailed analysis of the power sector and problem tree analysis are in Appendixes 2 and 3, respectively.

9. Inefficient Utilization of Energy Resources. Another prominent problem of the power network is the shortage of peak power supply. Hydropower plants with only 14% of the available capacity of all power generation and lower reliability due to aging of equipment and seasonality, cannot meet peak demands adequately. Large thermal power plants which have not been upgraded have to participate in the shifting operation, thus, reducing the efficiency and stability of generating units and excessive consumption of fuels. Due to lack of sufficient peak power supply, AzerEnergy has imported power from abroad in the peak hours as well as in the winter season with higher demand.

10. Deterioration of Power Facilities. Over 20% of all energy equipment and over the half of the network facilities are well beyond their useful life. This inevitably reduces the reliability and efficiency of the power network operation. The high level of physical wear of the equipment at
power plants and networks leads to frequent power failures in the populated areas and at the economic facilities in the country. The available capacity of generation plants in total are 80% of their installed capacity and efficiency of some of the plants are as low as 25%. The inadequate capacity of transmission lines also results in the shortage of reserves in the stability of power system, increasing potential risk of reliable operation of the power system.

11. **Inadequate Maintenance and Rehabilitation.** The power sector has suffered from inadequate funding to perform essential maintenance functions and introduce new technology. The result has been a distinct deterioration in the quality of the infrastructure and associated deterioration in the quality of service. The power grid is becoming increasingly exposed to the risk of systemic collapse. Rehabilitation and upgrading of transmission facilities could significantly reduce the risk of system failure.

12. **Government Strategies and Policies.** The principal objectives of the power sector development are to efficiently utilize domestic energy resources, protect the country’s energy security, and ensure the delivery of reliable and adequate electricity services for sustained economic growth. To accelerate the power sector reform and development, the Government has set the overall policy framework for the power sector development which has the following components: (i) sector restructuring to separate the ownership and management of generation, transmission and distribution; (ii) development of a regulatory framework and institutions to promote competition and ensure the financial viability of sector enterprises; (iii) introduction of targeted social protection programs to mitigate the impact of higher tariffs on vulnerable groups; and (iv) involvement of the private sector in the operation and financing of generation and distribution facilities.

13. Since 2005, the Government has been implementing and consolidating reforms in the utilities and infrastructure sectors, through financial restructuring of the large natural monopolies; separation of commercial and regulatory functions; and introduction of proper regulatory framework. Progress on sector restructuring has been achieved, in part due to the establishment of four regional distribution companies, private sector operation in the generation, and creation of Ministry of Economic Development (MED) responsible for energy sector policy making, pricing and tariffs, licensing, and management of fixed assets. The Tariff Council, chaired by MED, has authority to propose tariff adjustments, define customer categories, and adopt cost-reflective tariff design. Furthermore, the Government has ordered that all large companies have to change to International Financial Reporting Standards (IFRS) by January 2008, and all government ministries have to implement the International Public Reporting Standards by January 2009. These reforms are under the management and control of the Ministry of Finance.

14. The Government recognizes the importance of using energy resources efficiently and the delivery of affordable utility service of acceptable quality is an essential requirement in enhancing the living standards of the population. Consequently, the Government has developed a *State Program for Development of Fuel and Energy Sector in Azerbaijan (2005–2015)*, which identifies and sets development targets for the various subsectors.

15. The State Program envisages the development of the power sector and plans to restructure the sector, expand generation and transmission facilities, and introduce modern management system, including (i) development of new combined cycle gas turbine generation units and hydropower generation capacities; (ii) modernization and reconstruction of power facilities - increasing efficiency and prolonging useful life and expanding available capacities; (iii) promoting the development of small hydropower and other renewable energy sources (wind and
solar) to supplement energy balance; (iv) construction of new substations and transmission lines in order to expand transmission and distribution networks; (v) reconstruction and upgrade of dispatch control systems; (vi) strengthen cross-border links with Russian and Iranian grids to increase power trade capacity; (vii) increase investments for energy sector development and attract foreign investments; and (viii) expanding regional cooperation and participating in formation of regional energy markets.

16. The Government has established a medium-term tariff policy that incorporates a transition to full cost recovery for utility service providers with a 10% return to equity. This will enable the utilities to become financially self-sustaining. The 'Tariff Council' chaired by the Minister of Economic Development determines the retail and wholesale tariff as well as the gas and fuel supply price. The council meets quarterly.

17. The electricity tariff was increased in January 2007 from $0.024 per kwh to $0.075 per kwh for the first time since 1997. During the same period the minimum wage has increased by five times. Also other costs, including fuel, have increased by many folds during this time. Subsidies to energy utilities were in the order of about $320 million in 2006 and decreased to zero from 2007. The amount could now be used for targeted social safety net expenditures. Compared to 2006, the consumption was decreased by 3 GWh in 2007. This is a direct result of higher tariffs and better collections through the introduction of smart metering systems and prepaid system in some of the towns. The collection of utility payments has been substantially improved from around 53% (2007) to 73.% (2009). The current industrial and electricity tariffs are $0.0525/kWh from 8am to 22pm/ $0.025/kWh from 22pm to 8am and $0.075/kWh, for household/commercial/ governmental.

3. Opportunities for ADB

18. Azerbaijan’s unreliable and inefficient power network has been a bottleneck to sustained economic growth and rapid poverty reduction. Three key priority areas for ADB’s assistance have been identified: (i) rehabilitation of power grid for improvement of power supply quality and loss reduction; (ii) development of renewable energy; and (iii) improvement of demand-side energy efficiency and energy conservation. A comprehensive roadmap for investment in the sector is being developed with ADB assistance. Immediate investment for augmentation, rehabilitation and replacement of generation, transmission and distribution assets has been fast-tracked by the Government and is on-going. ADB is exploring suitable investment projects through both its public and private sector operations.

19. AzerEnergy has studied various options for reliable power supply including construction of new thermal power plants and renewable energy. For thermal power plants, 1,876 MW have been added or retrofitted since 2000. The existing Shirvan Thermal Power Plant (TPP) is the second biggest plant in Azerbaijan (22% of electricity production in 2006-2007). Commercial operation of the plant started in 1968. Available capacity is only 76% of its installed capacity of 1,050 MW, and average operational efficiency is 27%. Due to its inefficiency, the plant is wasting fuel which could otherwise be exported or used to produce more power. The replacement of the Shirvan TPP with the 780 MW Project was fast-tracked as a priority project and started in 2007.

20. The original financing plan for the Project envisaged AzerEnergy combining the proceeds from international commercial bank loans, self financing from AzerEnergy and funds from Government budget. In 2008, Financing Phase 1 for the Project was successfully arranged through a €285 million syndicated commercial bank loan to AzerEnergy guaranteed by the
Government.\textsuperscript{4} However in 2009, Financing Phase 2 could not be executed due to competing demands on Government budget and the scarcity of long-term commercial bank loans from international and local banks. The scarcity caused by the global financial crisis extends to most emerging market infrastructure projects without credit enhancement from a highly rated third party. This led to discussions with ADB, IsDB and other strategic partners, which resulted in a revised financing plan that includes a second commercial bank loan with support of an ADB PCG, having a term long enough to match the cash flow of the Project.

\textsuperscript{4} Of AzerEnergy's AZN 1.38 billion\textsuperscript{\textsuperscript{4}} of long term borrowings as at 31 December 2008, 55% was from international commercial banks (with and without export credit agency support), 4% from a local bank (International Bank of Azerbaijan), 28% from external assistance and 13% from the Ministry of Finance.