

ENERGY SECTOR BACKGROUND BRIEF

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Energy Sector Background Brief

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Executive Summary

Key Opportunities

- Much of the existing power infrastructure in the region is crumbling and badly in need of repair, while all of the countries have identified several prospective new energy projects that could be brought online.
- The CAREC region has new potential sources of energy resources, such as the Caspian Sea, and even Afghanistan represents an essentially new energy source with its coal and oil.
- Many of the energy reforms and institutional capacity building that is taking place will result in more concessions becoming available for private investors.
- The ongoing privatization processes in the region also present extensive opportunities for equity stakes, joint ventures, and majority-owned foreign enterprises.
- Seismological and prospecting works, and geological and exploration surveys of prospective oil, gas, and coal deposits are top priorities in the CAREC countries.
- Opportunities exist in replacing outdated equipment and technology.
- Renewable energy represents an emerging investment opportunity to overcome the heavy reliance on fossil fuels.

Major Impediments

- Electricity tariffs are unrealistically low in much of Central Asia. Tariff rates have been purposely kept low for political reasons, despite the fact that the real costs of electricity are generally well above the current tariffs.
- The electricity billing and collection systems throughout the region are highly inefficient with large uncollected debts and severe under-billing.
- CAREC region energy resources cost more than the Middle East, Russia, and other major suppliers because of remoteness, insufficient infrastructure, high transportation costs, and higher extraction costs.
- State-owned enterprises, budgeting, and regulatory authorities operate with minimal transparency, and they need to upgrade their budgeting, accounting, and auditing systems to meet international standards.
- The capacities of government institutions in the energy sector are generally low, and thus many of the technical, financial, and managerial skills for operating at the international level are lacking among the staff.
- The region is still perceived as potentially turbulent and lacking the political stability that other energy-rich regions appear to have.

Possible Recommendations

- The CAREC countries should aim for a few selected, fast-tracked, quality private sector investments to demonstrate to the international community that Central Asia is committed to attracting private sector involvement in the energy sector.
- Intensified efforts at regional energy cooperation are required to reduce the costs of energy resources in the region.

I. ENERGY SECTOR OVERVIEW

A. Introduction

The countries involved in the Central Asia Regional Economic Cooperation (CAREC) program have significant potential to become one of the world's leading suppliers of energy. The region holds enormous reserves of oil, natural gas, and coal, while the hydropower potential represents a potential major source of renewable energy. Most of the energy resources in Central Asia have yet to be exploited, and thus investment and business opportunities abound. However, the energy sector in Central Asia faces several challenges in harnessing its resources and becoming a globally competitive energy market. Years of under-financing has left much of the limited infrastructure in disrepair, the legal and regulatory frameworks are not well suited yet for significant private sector involvement in the sector, transport costs for oil and gas are high, and tariff structures are often not commensurate with the actual costs of electricity.

B. Development of Energy Networks¹

The oil and gas pipelines in Central Asia were primarily developed under the Soviet Union. Most of the pipelines in the region run through Kazakhstan, and with the exception of the new international oil pipeline between Kazakhstan and China (completed in late 2005), all of the oil pipelines in Kazakhstan connect with pipelines in Russia. Figure 1 shows the layout of oil and gas pipelines in Central Asia as of 2005.² Figure 2 shows a wider perspective of the gas pipelines except for the connection with China (see Figure 3 for another map clearly indicating Kazakhstan-China route).

Figure 1. Oil and Gas Pipelines in Central Asia



Source: http://www.cnr.vt.edu/boyer/geog1014/TOPICS/124cent_as/c_asia.html

¹ This section draws in part from the UNDP, "Silk Road Investor Guide," produced for the Silk Road Investment Forum 2006, Xi'an, China, June 7-9, 2006.

² At the time the map was produced, the Kazakhstan-China oil pipeline was still under construction.

Figure 2. Gas Pipelines in Central Asia



Figure 3. Kazakhstan-China Oil Pipeline



Source: Energy Information Administration, U.S. Department of Energy
(www.eia.doe.gov/emeu/cabs/Centasia/Background.html)

The major gas pipelines in Central Asia originate in the southern part of the region and run northward through Kazakhstan and into Russia. Other routes run in a more west-east direction through Tajikistan and into the Kyrgyz Republic and also into Kazakhstan's southeast region.

Further east, China opened in January 2004 its West-East Gas Pipeline, which is a 4,200-kilometer pipeline operated by the state-owned Petro China. The \$24 billion pipeline provides gas from the Tarim Basin in Xinjiang Uygur Autonomous Region (XUAR) and the Changqing gas field in Shaanxi and transports it to eastern China, ending in Shanghai. The West-East Gas Pipeline can deliver up to 12 billion cubic meters of natural gas per year.

The electricity generation and transmission systems of the newly independent Central Asia countries were developed under the Soviet Union as a regional grid. It combined the hydropower, coal, oil, and gas resources and facilities from across the region, but the regional grid was in reality “an irregular structure extending across several countries, partly as an interconnected grid, partly as an isolated power system or sub-system...”³ Following independence in 1991, the Central Asian countries’ electricity systems remain interdependent, and the Central Asia Power System enables interchanges of power among the countries.

The capacities of the power systems in the CAREC countries are shown in Table 1. Afghanistan’s relatively small installed capacity despite a rather sizable population by Central Asian standards reflects the problems the country has faced the past two decades in maintaining its electricity supply as opposed to the potential generation resources available. Each of the countries has extensive potential for increasing power capacity.

Table 1. Capacities of Central Asia Power Systems

	Afghan- istan	Azerbai- jan	Kyrgyz Rep.	Tajiki- stan	Uzbeki- stan	Mongolia	Kazakh- stan	Xinjiang
Installed Capacity Hydro (MW)	n.a.	800	2,950	4,059	1,710	n.a.	2,000	n.a.
Installed Capacity Thermal (MW)	n.a.	4,700	763	346	9,870	n.a.	16,240	n.a.
Installed Capacity Total (MW)	310	5,500	3,713	4,405	11,580	789	18,240	4,744
Available Capacity (MW)	n.a.	4,300	3,100	3,428	7,800	n.a.	13,840	n.a.

Sources: World Bank, “Central Asia Regional Electricity Export Potential Study,” December 2004; Tumensogt Tsevegmid, “Mongolia Energy Sector: Promoting Sustainable Energy Development and Regional Cooperation,” presentation at Northeast Asia Energy Security and Cooperation KEEI and IEA Joint Conference, March 2004, Seoul, Korea; UNESCAP (<http://www.unescap.org/esd/energy/information/electricpower/2001-2002/html/azerbaijan.htm>); and International Atomic Energy Agency (<http://www.iaea.org/inis/aws/eedrb/data/AF-elic.html>).

China’s XUAR is becoming a major electricity generation and transmission point in the country. The “West-to-East Power Transmission Project” originating in XUAR transfers the rich energy resources from the west to the coastal areas in the east that have a great demand for power.

³ Asian Development Bank, “Regional Economic Co-operation in Central Asia – Electric Energy,” December 2000.

II. ENERGY SECTOR FEATURES AND ENDOWMENTS

The CAREC member countries contain significant amounts of energy resources, but the endowments often vary from country to country. This section gives a brief summary of the resources and estimated reserves by country.

Afghanistan

Afghanistan holds about five trillion cubic feet of natural gas and 100 million barrels of oil reserves. All significant oil and gas exploration and development occurred in northern Afghanistan during the Soviet times, and it is believed that the natural gas estimates could be much higher.

Azerbaijan

The actual amount of oil within Azerbaijan is uncertain, but estimates range from 550 million to 1 billion tons. A 2004 British Petroleum report announced that Azerbaijan has 7 billion barrels (1 billion tons) of proven oil reserves, but this excludes the anticipated huge amounts of oil under the Caspian Sea. With a figure of 1 billion tons, the known reserves comprise 0.6% of the world's oil reserves. Natural gas reserves in Azerbaijan are estimated to be 1.37 trillion cubic meters, equivalent to 0.8% of the world's total.

Kazakhstan

In Kazakhstan, proven onshore oil reserves are approximately 28 billion barrels, and some estimates of the probable reserves in the Kazakh part of the Caspian Sea reach 100 million barrels.⁴ With its known onshore reserves, Kazakhstan has over 2% of the world's proven oil reserves. Kazakhstan is also well endowed with natural gas. There are an estimated 19.5 trillion cubic meters beneath the ground. Additionally, Kazakhstan has 25% of the world's uranium reserves and an estimate 64 billion tons of coal.

Kyrgyz Republic

The Kyrgyz Republic does not have the oil and gas reserves of many of its regional neighbors, but the country has 26,000 MW of hydropower potential and only 10% has been utilized. Also, Kyrgyz Republic has 1.2 billion tons of coal. The country has a gas network covering the oblasts of Bishkek and Chui in the north and Osh and Jalalabad in the southern region.

Mongolia

Mongolia's potential reserves of coal are approximately 125 billion metric tons. Many of these reserves have been proven, but they remain undeveloped due to a lack of infrastructure. One example is the huge Tavantolgoi deposit in the Gobi Desert, which contains over 5,000 million metric tons of coking and steam coal, but lies more than 400 kilometers from the nearest railway. The geological features and results of initial oil explorations indicate that Mongolia could become a regular producer.

Tajikistan

Tajikistan has proven oil reserves of 120 million barrels. Its natural gas reserves total 60 billion cubic meters.

Uzbekistan

Uzbekistan is most known in the energy field for its natural gas reserves, which amount to 1.9 trillion cubic meters. The country also has an estimated 600 million barrels of oil. Uzbekistan has extensive water reservoirs, irrigation channels, and mountain rivers. Assessments of the country's hydropower potential estimate that over 141 power stations could be constructed with a capacity of 1,180MW capable of generating an annual electricity production of 4.6 billion kilowatt/hour.

⁴ Azhar Kadrzhanova, "Energy Sector Overview in Kazakhstan," Export USA (www.buyusainfo.net/docs/x_5598441.pdf)

Xinjiang Uygur Autonomous Region

XUAR is one of China's most important energy sources. Xinjiang's proven oil reserves stand at 20.9 billion tons, which is about one-quarter of China's onshore oil reserves. XUAR is believed to have over 8 trillion cubic meters of natural gas, with already 1.38 trillion cubic meters verified.⁵ Xinjiang's Tarim Basin alone has 400 billion cubic meters. Xinjiang's gas reserves in the Tarim, Junggar and Turpan-Hami basins account for one-third of the country's total. XUAR holds nearly 2.2 trillion tons of coal, comprising 40% of China's total, but current recoverable reserves are approximately 95 billion tons.

III. SECTOR PERFORMANCE

A. Oil and Gas

Recent production and export figures for crude petroleum and natural gas are shown in Tables 2-5 for the countries in which data are available. Petroleum production and exports over the past five years are generally on the rise, and the three producers in Tables 2 and 3 have greatly increased production and exports compared to 2001.

Table 2. Crude Petroleum Production in CAREC Countries, 2001-05 (in '000 m.t.)

	2001	2002	2003	2004	2005
Azerbaijan	14,909	15,333	15,381	15,548	22,212
Kazakhstan	36,060	42,068	45,376	50,672	51,258
Tajikistan	16	16	16	19	22

Source: Asian Development Bank, Key Indicators 2006, Manila: ADB, 2006

Table 3. Crude Petroleum Exports in CAREC Countries, 2001-05 (in '000 m.t.)

	2001	2002	2003	2004	2005
Azerbaijan	8,462	8,881	8,997	9,048	14,036
Kazakhstan	32,378	39,134	44,265	52,419*	50,151
Tajikistan	3	5	5	7	6

* Exports higher than production in 2004 likely explained by the imports of petroleum.

Source: Asian Development Bank, Key Indicators 2006, Manila: ADB, 2006

Natural gas production in the region has not shown quite the same improvement as petroleum since 2001, but natural gas exports from two Kazakhstan and Uzbekistan increased a combined 120% in 2005 over 2001.

Table 4. Natural Gas Production in CAREC Countries, 2001-05 (in billion cubic meters)

	2001	2002	2003	2004	2005
Azerbaijan	5.5	5.1	5.1	4.9	5.7
Kazakhstan	11.6	14.1	16.6	21.9	25.2
Tajikistan	0.052	0.033	0.033	0.036	0.029
Uzbekistan	57.4	58.4	58.1	n.a.	60.3

Source: Asian Development Bank, Key Indicators 2006, Manila: ADB, 2006

⁵ Fu Jing, "East-West Gas Pipeline Wrapped Up," China Daily, 4 August 2004 (www.chinadaily.com.cn/english/doc/2004-08/04/content_357382.htm)

Table 5. Natural Gas Exports in CAREC Countries, 2001-05 (in billion cubic meters)

	2001	2002	2003	2004	2005
Kazakhstan	5.5	10.4	11.0	17.3	15.4
Uzbekistan	7.0	4.6	7.5	n.a.	12.4

Source: Asian Development Bank, Key Indicators 2006, Manila: ADB, 2006

Specific production figures for XUAR were not available, but oil and gas production in Xinjiang accounted for 33% of gross industrial output in 2004.

B. Coal Production

Coal production statistics for the past five years are presented in Table 6. Tajikistan has made important strides in increasing its production since 2001 with a four-fold increase, and Mongolia is the only other country to increase its output every year over that period.

Table 6. Coal Production in CAREC Countries, 2001-05 ('000 m.t.)

	2001	2002	2003	2004	2005
Afghanistan	n.a.	21	35	34	n.a.
Kazakhstan	79,135	73,731	84,907	86,822	86,385
Kyrgyz Rep.	475	459	415	461	332
Mongolia	5,141	5,544	5,666	6,865	7,517
Tajikistan	24	36	47	68	100
Uzbekistan	2,711	2,736	1,913	2,699	3,003

Source: Asian Development Bank, Key Indicators 2006, Manila: ADB, 2006

Coal exports have declined in Kazakhstan and the Kyrgyz Republic, but Mongolia has finally begun to tap into its potential for exports.

Table 7. Coal Exports in CAREC Countries, 2001-05 ('000 m.t.)

	2001	2002	2003	2004	2005
Kazakhstan	28,515	22,664	26,890	24,338	24,138
Kyrgyz Rep.	19	101	31	44	9
Mongolia	n.a.	n.a.	435	1,560	2,116
Tajikistan	n.a.	n.a.	0	0	1
Uzbekistan	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Asian Development Bank, Key Indicators 2006, Manila: ADB, 2006

C. Power Production and Consumption

The post-independence years for the Central Asian republics saw steep declines in power generation as financing came to a sudden end and cross-border energy trade fell sharply. Kazakhstan has slowly increased its power production since the new millennium, but the levels are still well below those of pre-independence. Tajikistan and Uzbekistan are also still producing electricity below the levels of 1991. With the exception of China, the lack of proper investment in operations and maintenance has eroded the energy asset base, and the power systems tend to experience high levels of technical losses (e.g., 24% in the Kyrgyz Republic) and irregular supply.

Table 8. Electricity Production in CAREC countries 2001-05 (in billion kilowatt hours)

	2001	2002	2003	2004	2005
Afghanistan	0.68	0.56	0.82	0.78	n.a.
Azerbaijan	19.0	18.7	21.3	21.7	22.6
China	1,472	1,640	1,911	2,187	2,475
Kazakhstan	55.4	58.3	63.9	66.8	n.a.
Kyrgyz Rep.	13.7	11.9	14.0	15.1	14.9
Mongolia	3.0	2.5	3.1	3.3	3.4
Tajikistan	14.4	15.3	16.5	16.5	17.1
Uzbekistan	48.0	49.4	n.a.	n.a.	47.7

Source: Asian Development Bank, Key Indicators 2006, Manila: ADB, 2006

Electricity exports from Central Asia remain limited despite the high potential for exports within and from the region. Recent export figures are shown in Table 9. China's electricity production is barely keeping pace with consumption, and rising demand leaves little scope for exports.

Table 9. Electricity Exports from CAREC Countries, 2001-05 (in billion kilowatt hours)

	2001	2002	2003	2004	2005
Azerbaijan	1.0	0.9	0.9	1.0	1.4
China	10.0	10.0	10.0	9.0	11.0
Kazakhstan	1.6	2.0	5.0	7.4	4.0
Kyrgyz Rep.	2.2	1.1	1.7	3.4	2.7
Mongolia	0.018	0.016	0.007	0.008	0.012
Tajikistan	4.0	3.9	4.6	4.5	4.3
Uzbekistan	13.0	n.a.	n.a.	n.a.	n.a.

Source: Asian Development Bank, Key Indicators 2006, Manila: ADB, 2006

Electricity consumption in the CAREC region has been beset by numerous problems with collapsing infrastructure and painful adjustments to the new economic systems. Increasing poverty and weak management of public utilities were also responsible for decline in consumption during the 1990s. Consumption levels have, however, gradually picked up over the last five years in most of the region (see Table 10).

Table 10. Electricity Consumption in CAREC Countries 2001-05 (in billion kilowatt hours)

	2001	2002	2003	2004	2005
Afghanistan	0.44	0.30	0.74	0.62	n.a.
Azerbaijan	17.1	16.3	18.4	19.0	19.6
China	1,463.0	1,633.0	1,903.0	2,178.0	n.a.
Kazakhstan	52.2	58.8	62.2	n.a.	68.4
Kyrgyz Republic	11.8	n.a.	n.a.	n.a.	n.a.
Mongolia	1.9	2.0	2.2	2.4	2.5
Tajikistan	15.7	16.1	16.5	16.8	17.3
Uzbekistan	48.5	49.3	n.a.	n.a.	n.a.

Source: Asian Development Bank, Key Indicators 2006, Manila: ADB, 2006

IV. LEGAL AND REGULATORY ENVIRONMENT FOR THE ENERGY SECTOR

The CAREC member countries have made progress with numerous legal reforms since the early 1990s, such as new commercial legislation and tax codes, but the legislative and regulatory frameworks in these countries are still evolving and prone to change in response

to new circumstances and attempts to create more favorable business conditions. Despite improved the business environment, the implementation and enforcement of the legal and regulatory frameworks and the governing institutions upholding them have not always kept pace. Bureaucratic red tape for businesses has been reduced and continues to be addressed through regional trade facilitation programs, bilateral agreements, and unilateral simplification of procedures, but obstacles and delays are still common and increase transaction costs for firms. Gradual improvements are being made in areas such as investor protection, corporate governance standards, and in company, securities, and bankruptcy laws, but as a whole Central Asia does not measure up to the standards in the new members of the European Union or the Baltic States. The remainder of this section reviews some of the major pieces of legislation and regulation pertaining to the energy sector in each CAREC member.⁶ However, not all of the important legislation is covered here because they were unavailable or not in English.

Afghanistan

In 1986, the "Afghanistan's Usage of Electricity Act" established the Ministry of Water and Power (MWP) as the body responsible for the power sector in Afghanistan. The act also defines the right of customers and the responsibilities of MWP with regard to generation and supply of electricity and the development of new and renewable energy resources. The power sector in Afghanistan is totally owned by the Government and operated through the MWP and a set of government enterprises. The Enterprises Act of 1980 created five autonomous agencies for the energy sector, covering generation, transmission, civil work for power stations and distribution lines, and other areas.

The Ministry of Mines (MOM) and other relevant ministries promulgated the Minerals (July 2005) and Hydrocarbon Exploration and Production (December 2005) Laws. Both laws are said to be of international standards, apply to local and foreign investors, and are meant to enable the transparent allocation of mineral and hydrocarbon rights to private entities.

The 2005 Amendment to the Income Tax Law has specific provisions for extractive industry investors. These provisions cover depreciation, amortization, loss carried forward, and stability.

Azerbaijan

The 1996 Law on Utilization of Energy Resources is the main piece of legislation in the energy sector. Oil and gas contracts with investors typically involved entering into a production sharing agreement (PSA) with the State Oil Company of Azerbaijan (SOCAR) that is subsequently ratified by parliament. The establishment of a Ministry of Fuel and Energy, renamed the Ministry of Energy and Industry (MEI) in 2004, has not changed this practice very much, but the MEI has been given nominal responsibility for concluding PSAs.

Azerbaijan also has a 1997 Law on Tenders that covers all natural resources and subsoil assets. The law describes the procedures and qualifications for tendering. For royalties, the 1995 Law on Royalties says that, the "procedure of estimation and term of payment are determined by the Main State Tax inspection of the Azerbaijan Republic on agreement with the Ministry of Finances of the Azerbaijan Republic."

The 2000 Tax Code can be superceded by the terms of a PSA or other agreement or law if they differ from the Tax Code.

Kazakhstan

The Law on Electricity (2004) is the main piece of legislation governing the power sector. Kazakhstan also has the 1997 Law Concerning Energy Saving, which establishes the economic and organizational conditions for using fuel and energy resources and

⁶ No details of energy-related laws were obtained for Tajikistan or Xinjiang.

environment protection. The state-owned Kazakhstan Electricity Grid Operating Company (KEGOC), started in 1997, controls the management of the energy transmission system in Kazakhstan. Several monopolies exist in the energy sector. Pricing for goods and services are determined by the Agency for Regulation of Natural Monopolies and Protection of Competition, and Small Scale Business Support.

Kyrgyz Republic

The Kyrgyz Republic has promulgated several pieces of legislation for the energy sector. The 1996 Law on Energy is meant to increase economic efficiency and reliability of the energy sector (i.e., fuel) and protect the interests of consumers and producers. All energy resources belong to the state and require a license for exploitation. The Energy Law established the State Energy Agency, which issues licenses in the energy sector, establishes prices and tariffs, and attempts to promote competition, among other functions. The law also created the National Energy Program that outlines the main trends in the various energy sub-sectors.

The Law on Electricity was passed in 1997 in order to assure the supply of electricity and thermal energy. It also sought to create a competitive environment and energy market, encourage the private sector to participate, and attract investment. Licenses must be obtained from the State Energy Agency to participate in generation, transmission, distribution, or sale of electricity or thermal energy. Decisions on issuing a license are to be made within 30 days of receiving an application. The law allows energy generators to sell their electricity or thermal energy to the national power grid, distributors, or major consumers. It also says that distributors must use a standard contract drawn up by the government to supply electricity to consumers. Another law pertaining to the power sector is the 1998 Law on Energy Saving.

The Law on Subsoil (1997) states that the subsoil is owned exclusively by the central government. Subsoil users may be legal entities or individuals of the Kyrgyz Republic or foreign states, and the right to use the subsoil is granted on the basis of licenses. Licenses for geological study are granted for two years with the possibility of extending for up to 10 years, but the area for which the license is granted may have additional licenses issued to other licensees for different resources. In contrast, the license for mining provides the licensee the exclusive right over all the minerals in that area for 20 years. The tendering process for subsoil rights is described in the law. The Law on Licensing came out in 1997.

The original Law on Concessions and Foreign Concessionary Entities was issued in 1992 and covers all the procedures and requirements for concession agreements, which may last from 5 to 50 years. The law describes the rights and responsibilities of the concession agency and concessionaire. In 2004 the amended Concession Law created opportunities for concessions with electricity distribution companies, which are joint stock companies majority owned by the state. The conclusion and implementation of concession agreements are determined by the volume of the capital investment. Concessions below \$300,000 are administered by district and city state administration and appropriate Councils of People's Deputies; below \$800,000 are administered by region and Bishkek state administration and appropriate Councils of People's Deputies; and over \$800,000 or those run by Government bodies are administered by the central government or its authorized agencies.

The Kyrgyz Republic's Law on Oil and Gas was issued in 1998.

Mongolia

Mongolia's Law on Subsoil (1989) declares that the subsoil is the property of the state. The law defines the authority of various central and lower level government bodies in the administration of the subsoil and its resources. It also covers how users may utilize the subsoil, including extraction of resources and storage or burying of substances below ground. There can be "unlimited lease" arrangements that do not specify the number of

years for a user of the subsoil in an area or fixed periods that do not exceed 30 years (with the possibility of a 20-year extension). The basic duties and rights of users are defined in the law, including the requirement to hand over to the state any precious metals or gemstones found. The law also covers the details and requirements for conducting geological surveys, and the requirements for constructing structures above and underground for mining.

Mongolia's Petroleum Law, enacted in January 1991, was ranked in 1995 as one of the top 10 best petroleum laws in the world. The Law covers the exploration for and the protection, processing, transportation, storage, and marketing of petroleum from within the country. The law lays out the basic requirements of petroleum contracts and describes the permits required to conduct petroleum operations (i.e., land permit from local government and mining permit from the central government). Exploration periods are limited to five years, which can be extended twice for two years each time. Oil field development is set for a limit of 20 years, unless the operator establishes a processing plant or oil or natural gas pipeline, in which case it can be extended two times by five years each time. The Law says that the government will determine royalties and that production sharing percentages will be negotiated and written in the contracts.

The 2001 Law on Energy (and its amendments in 2002) covers energy generation, transmission, distribution, construction of energy facilities, and energy consumption. The Law outlines the powers of various state authorities concerning the energy sector, including the authority of lower levels of government. It also establishes a Regulatory Authority for the energy sector that controls licenses and determines tariffs, along with Regulatory Boards for the aimags (provinces) that govern compliance with licenses in their areas. The Law specifies the energy activities that require licenses; details of issuing a license; the rights and obligations of holders; and procedures for obtaining a license (decisions must be made within 60 days of receipt of application). Licenses range from 5 to 25 years, depending on the type of activity. The Energy Law allows the Regulatory Authority and the aimag Regulatory Boards to annually review tariffs and the terms of services of providers.

The Law on State and Local Government Property as amended in 2005 (also referred to as the Law on Concessions) establishes a framework for granting concessions to private investors to use existing infrastructure owned by the state and to construct new infrastructure facilities. This covers heat and electricity, along with oil and gas pipelines, storage facilities, and transport. The amendments state that a concessionaire is to be selected in accordance with the procedures from the Law on Public Procurement except that foreign investors cannot be excluded from the tendering or pre-qualification processes. However, foreign investors may be required to establish a legal entity incorporated in Mongolia if the terms of the pre-selection document or proposal specify this. The amendments of the Law define the contents of concession agreements. Concessions are given a limit of up to 50 years. Tariff stabilization agreements are possible under the amended law.

Uzbekistan

The Law on Natural Monopolies (originally promulgated in 1997 and revised in 1999) regulates the scope of activities carried out under natural monopolies of goods or services. This law applies to oil, gas, and coal extraction; oil and gas pipelining; and the production and transmission of electric power and thermal energy. Based on a number of factors listed in the law, methods such as fixed prices and tariff limits are established for the "subject" of a natural monopoly. The law also specifies the authority of the government's anti-monopoly agency.

The 1994 Law About Subsoils states that the subsoil is the exclusive property of the Republic of Uzbekistan. It grants the Cabinet of Ministers the authority to organize the licensing system for the use of subsoil and the utilization of the state fund for subsoils. Local government authorities are granted the power to control and supervise works involving the

subsoil and to suspend activities that infringe on the Law. Foreign invested companies are entitled to use the subsoil for geological studies as determined by legislation. The Law describes the licenses for mining and other purposes. It also describes the rights of subsoil users and the reasons for terminating those rights.

The Law on Rational Use of Energy (1997) is meant to conserve national energy resources and improve the efficiency of energy use. It applies to the production, distribution, and consumption of thermal and electric energy. One objective is to stimulate the development and application of energy efficient technologies to extract and produce less expensive petroleum products, natural gas, coal, and other natural fuels. The Uzbekistan State Center of Standardization, Metrology, and Certification at the Cabinet of Ministers implements the law by setting standards and norms for energy efficiency and energy quality. The Law gives the government the authority to introduce specific energy consumption regimes and license activities in the field of energy audit and examination. Compulsory audits are required for all enterprises, organizations, and institutions consuming energy resources over 6,000 tons of equivalent fuel per annum or more than 1,000 tons of motor fuel.

V. GOVERNMENT POLICIES, STRATEGIES, AND PROGRAMS

Most of the CAREC member countries are in the process of restructuring their energy sectors. The governments recognize the crucial role that foreign investment plays in the energy sector, and therefore privatization and liberalizing the energy sector are key themes found in the region. Other prominent policy initiatives in the region include capacity building for energy regulatory authorities and energy conservation/sustainability.

Afghanistan

Afghanistan plans to restructure its power sector in order for it to provide the backbone to economic recovery. The strategic tools include restructuring, unbundling, improving the regulatory framework, commercialization, and privatization. A main goal is to increase private sector participation in the sector. The government is also prioritizing capacity building for the Ministry of Water and Power, particularly on electrical engineering and the operation of commercial enterprises.

The World Bank assisted Afghanistan in preparing the Power Sector Master Plan in 2004. It provides the basis for investment decisions for developing the power generation and transmission system up to 2020. The Master Plan recommends using thermal and hydropower resources supplemented by imported energy for selected regions of Afghanistan (due to the absence of a national energy grid). The Master Plan contains detailed recommendations for the rehabilitation and construction of transmission lines, repairs to existing power plants, updated feasibility studies for new hydropower and gas-fired plants, and importing energy from Uzbekistan.

Due to under-achievements in the energy and minerals sectors, the Ministry of Mines (MOM) aims to facilitate positive economic impacts by creating good governance through institutional strengthening and capacity building, and establishing conditions for an enabling environment to attract and retain private investments. Under the five-year the “Afghanistan Compact,” a commitment made by the Government of Afghanistan and the international community in January 2006, the goals for the energy and mining sectors are (i) the creation of an enabling regulatory environment for profitable extraction of mineral and natural resources by the end of 2006; and (ii) an improved investment environment and infrastructure to attract domestic and foreign direct investment to mining and natural resources by the end of 2010. The Interim Afghanistan National Development Strategy (I-ANDS) has an additional goal of increasing government revenue through minerals production. MOM is focusing on developing its capacities to carry out the respective laws under its realm. Also, along with the Ministry of Finance, MOM will eventually transform the energy sector from a government-owned and operated system to a private sector industry.

Azerbaijan

Azerbaijan's State Program for Development of Energy and Fuel Sector (2005 – 2015) prioritizes gas system rehabilitation and restoration of gas supplies in regional areas.

Kazakhstan

Kazakhstan's 2004-06 economic development plan includes the upgrade of power facilities, launching a North-South transmission line, and constructing small hydropower plants. The country also has a \$258 million program to upgrade the power grid networks by 2007. The Power Complex Development Program for oil fields in the Caspian Sea runs until 2015. The program aims to increase offshore oil production in the Caspian Sea to 2 million barrels per day by 2015. The government will offer over 100 offshore oil and gas fields for tender. The government also targets increasing gas production to 1.84 trillion cubic feet by 2015.

Kyrgyz Republic

The first phase of the Kyrgyz energy sector reforms occurred in 1998-2000, with emphasis on new energy and electricity laws to enable liberalization and reform, the creation of an independent regulatory body (State Energy Agency) to promote commercialization, and corporatizing KyrgyzEnergo. The second phase began in 2000 with an aim to improve the financial viability of utilities, and the reforms include tariff adjustments for cost recovery and encouraging private sector participation in gas and electricity distribution.⁷

The current energy sector development strategy has three policy measures: (i) improve financial viability by reducing losses and improving collections, and revising the tariff policy; (ii) implementing a social protection scheme; and (iii) private sector participation in domestic energy market and exports. The current strategy will focus on decentralizing heat delivery, preparing concessions for energy distribution, increasing the use of coal, rehabilitating the country's energy generation capacities, and reducing commercial loss.

Mongolia

Mongolia's National Energy Plan is intended to address the key issues in the energy sector such as assuring financial sustainability of the energy sector, strengthening the institutional framework for greater private sector participation, developing rural energy access, and improving affordability. For financial sustainability, the government will focus on resolving inter-company arrears. The Plan's approach for rural access and affordability entails regional development, improving subsidy mechanisms, increasing the efficiency of the electricity and heat supply, and improving the efficiency of heat-only boilers. The government will also continue to reform the energy sector (including commercialization and privatization) and improve the regulations to facilitate greater private sector involvement.

The Sustainable Energy Sector Development Strategy Plan (2002-2010) aims to establish a financially sustainable energy sector that provides cost effective energy. Mongolia's energy sector will be developed within a regional energy context, while at the same time taking advantage of new technologies and sources of energy that will further promote economic efficiency and environmental sustainability.

Tajikistan

In order to raise electricity tariffs closer to the real costs of production and distribution, Tajikistan's electricity tariff policy for 2007-10 will increase tariffs from \$0.75 per kW/hour to \$2.10 by 2010.

Uzbekistan

One of the energy sector programs in Uzbekistan entails the development of small hydroelectric power stations. The plans call for constructing 15 stations with a total capacity of 423 megawatts.

⁷ World Bank, "Kyrgyz Republic Infrastructure and Energy Sector Working Group, Joint Country Support Strategy FY2007-2010," January 2006.

VI. IMPEDIMENTS TO INVESTMENTS AND CONDUCTING BUSINESS

Harnessing the abundant energy resources in the CAREC region is affected by a number of impediments to new private sector investment. Lists of impediments could be compiled for each country, but instead the focus here is on a few pervasive regional impediments.

A significant impediment to private sector investment in the energy sector is the low, unrealistic tariffs for electricity. Tariff rates have been purposely kept low for political reasons in order to prevent discontent among the population, despite the fact that the real costs of electricity are generally well above the current tariffs. For example, the Kyrgyz Republic currently has a tariff of 1.5 US cents per kW/hour but the cost recovery level is 2.6 cents per kW/hour. Tajikistan is 0.6 cents per kW/hour and the cost recovery level is 2.3 cents per kW/hour. The low tariffs are one cause of the huge losses experienced by some of the Central Asian energy systems and they deter investment to some degree.

A second major impediment is the billing and collection systems throughout the region. The systems were inherited upon independence in the case of the newly independent republics, and they are highly inefficient with uncollected debts and under-billing. The billing and collection systems will have to be improved or turned over to the private sector to reduce operating losses and attract potential investors.

Third, CAREC region energy resources cost more than the Middle East, Russia, and other major suppliers. The amount of investment required to develop the region's energy reserves is in the tens of billions of dollars, and this makes the resources more costly.⁸ Several factors are involved. The remoteness of parts of Central Asia and the absence of infrastructure in many of these parts will significantly increase the costs of extracting resources. Also, transportation costs within Central Asia are quite high owing to numerous borders, inefficient cross-border procedures, and high levels of corruption. Furthermore, many of the resources are difficult and costly to extract. For instance, 70% of Kazakhstan's gas reserves are not actively developed because they are classified as difficult-to-recover and require significant capital investment.

Fourth, weak corporate governance in the energy sector also restrains greater investment. The state-owned enterprises (SOEs) for energy frequently lack professional management. The SOEs, budgeting, and regulatory authorities operate with minimal transparency, and need to upgrade budgeting, accounting, and auditing systems to international standards.

A fifth impediment is the capacity of government institutions in the energy sector. Institutional reform is still occurring throughout the region, and thus many of the technical, financial, and managerial skills for operating at the international level are lacking among the staff of these energy institutions. The time required to develop these capacities will surely effect the progress in rebuilding the CAREC energy sectors.

Lastly are the geopolitical concerns that many investors have about Central Asia. The region is still perceived as potentially turbulent and lacking the political stability that other energy-rich regions appear to have. Given the higher costs of harnessing some of the energy resources in Central Asia, the perceived political risks could cause potential investors to decide that the risks are too high at the moment given the limited returns.

VII. INVESTMENT OPPORTUNITIES

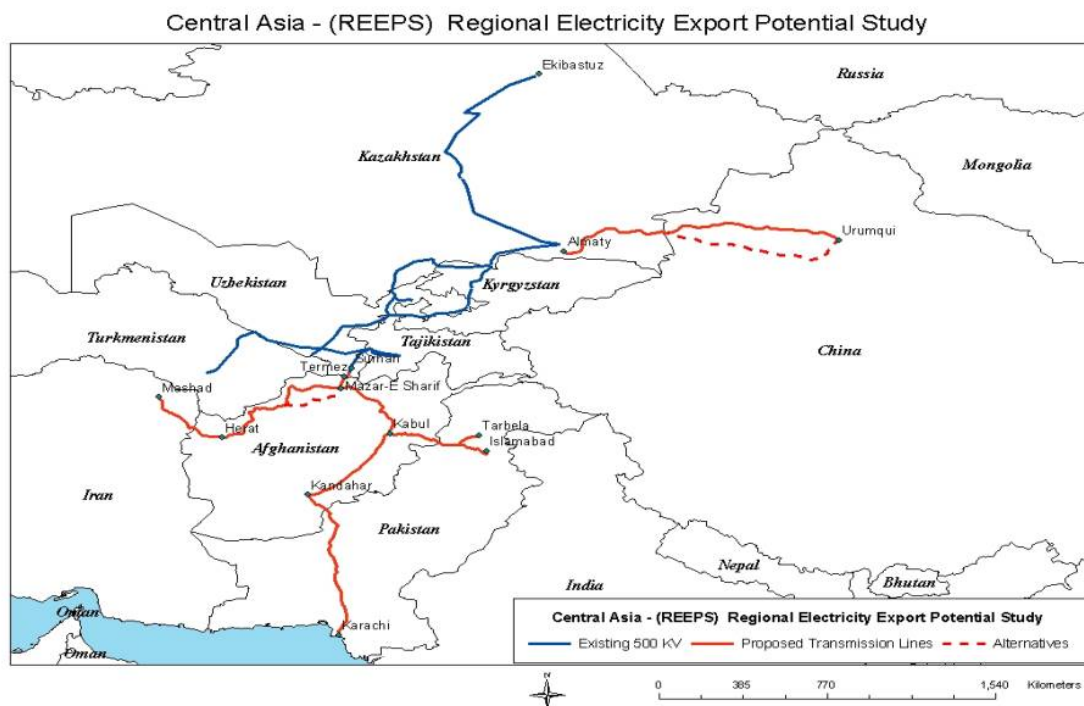
The CAREC member countries have a rich mixture of immediate and medium-term investment opportunities. As the impediments are addressed, more of these opportunities will become immediately available.

⁸ Commander Alan Lee Bowyer, "US Foreign Policy in Central Asia: Risks, Ends, and Means," *Naval War College Review*, Winter 2006, Vol. 59, No. 1.

One of the most obvious opportunities is in new and refurbishing energy production facilities. As noted earlier, much of the existing power infrastructure in the region is crumbling and badly in need of repair, while all of the countries have identified several prospective new energy projects that could be brought online. For example, Kazakhstan's Minister of Energy estimates that the country will need \$10.5 billion in investments in the electric power sector by 2015, comprising new production facilities and refurbishing existing ones. New facilities will be necessary throughout Central Asia to cover the winter deficits in some of the countries, and the goal of increasing electricity exports will certainly require additional new facilities to be constructed.

Exporting electricity from Central Asia has more long-term potential, because major new power generation projects in the region are expected to be viable only if access can be guaranteed to export markets outside the region.⁹ Some of these possible routes outside the region are shown in Figure 4.

Figure 4. Potential Electricity Export Transmission Links



Source: World Bank, "Regional Electricity Export Potential Study (Appendix Volume)," December 2004.

Equally significant opportunities are the new potential sources of energy resources. The Caspian Sea is likely to become one of the world's next major finds for oil and natural gas. Even Afghanistan represents an essentially new energy source with its coal and oil, and much of the country is still unexplored for reserves.

Investors will increasingly have chances to tender for known oil and gas fields and coal deposits as the Central Asian countries continue to prepare concessions. Many of the energy reforms and institutional capacity building that is taking place will result in more concessions becoming available for private investors.

⁹ UNDP Regional Bureau for Europe and the Commonwealth of Independent States, *Central Asia Human Development Report. Bringing Down Barriers: Regional Cooperation for Human Development and Human Security* (Bratislava: UNDP Regional Bureau for Europe and the Commonwealth of Independent States, 2005).

The ongoing privatization processes in the region also present extensive opportunities for equity stakes, joint ventures, and majority-owned foreign enterprises. Countries such as Afghanistan are preparing to overhaul their state-owned power sector, and nearly all of the other CAREC countries have an explicit goal of privatizing to enable more private sector participation in energy. The Kyrgyz Republic is privatizing all of its electricity distribution companies. In Uzbekistan, four power plants accounting for half of the installed capacity are scheduled for privatization, along with four distribution companies.

Seismological and prospecting works, and geological and exploration surveys of prospective oil, gas, and coal deposits are top priorities in the CAREC member countries. Many parts of Central Asia have not had proper geological surveys conducted, and thus plenty of opportunities exist for firms providing these services. Other services in high demand include:

- Engineering and construction
- Detailed seismic surveying and deep drilling to discover hydrocarbon deposits.
- Joint exploration and development of new fields and deposits.
- Financing

Another set of opportunities exists in replacing outdated equipment and technology. The energy systems in Central Asia are primarily built on decades-old equipment that is far from the current industry standard in terms of efficiency. Other equipment supplier opportunities in the region include:

- Drilling and production equipment; turbines and pumps; and other electrical equipment
- Sulfur removal and disposal technologies
- Petroleum software
- Well stimulation and gas treatment packages
- Environmental technologies
- Offshore production and operations in Kazakhstan, such as rig work, environmental technology, and support infrastructure.

Finally, renewable energy represents an emerging investment opportunity. The primary focus right now is on exploiting the fossil fuels in Central Asia, but a few of the countries are beginning to consider the long-term viability of such a strategy and have thus commenced with scenarios for renewable energy.

VIII. RECOMMENDATIONS

The international financial institutions involved in CAREC have presented numerous recommendations for the specific energy sectors in the CAREC countries. These detailed, technical recommendations are not repeated here, and instead some concise measures are suggested for the entire region to quickly facilitate more foreign investment into energy.

First, the governments of the CAREC members should aim for a quick set of achievements in greater private sector participation in the energy sector. A few selected, fast-tracked, quality private sector investments would demonstrate to the international community that Central Asia is committed to attracting private sector involvement in the energy sector. Each CAREC member should strive to achieve one or two high-profile investment projects/concessions within 1-2 years; these achievements should then be promoted by CAREC to demonstrate the progress in the region for private sector involvement in energy.

Second, the CAREC countries need to explore ways in which to reduce the costs of energy resources in the region, likely through improved regional energy trade agreements and greater interconnections among pipelines and electricity grids and transmission systems.

Intensified efforts at regional energy cooperation appear to be the best solution, and this requires greater political will from the member countries than has been shown to date.