Energy Priorities in the Central Asian States

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Overview

This paper reviews the current energy position and prospects of five Central Asian States (CAS) with particular emphasis on Uzbekistan, Kazakhstan and Turkmenistan and noting the degree of trade and inter- dependence between the states. The final paragraphs of the paper place the five Central Asian States within the wider context of the Euro-Asian energy market and the opportunities offered by new pipeline/ transmission line projects to provide links with Europe and through Afghanistan and Iran to Pakistan and India on one side as well as to China and the Middle East.

The five Central Asian States of Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan have a total population of some 56 million. They cover an area of 4.35 million square km, of which more than 60% is accounted for by Kazakhstan. They are characterized by their landlocked location, and Uzbekistan is one of the two double landlocked countries worldwide. This makes access to and from international markets quite difficult for the CAS countries, and also constitutes a hindrance to the enhanced export of primary energy sources to Europe or East and South Asia. Trade within the region, including energy trade, is also hampered by a number of other factors, although the fact that the countries are richly endowed with different types of energy resources is, in general, a positive stimulus to regional trade.

The Central Asian States are fossil fuel rich countries, which have been successful in implementing an export-led growth strategy for their economic development based on these natural resources. Among them, Kazakhstan has been the most successful with its vast oil resources and early recognition that foreign investment and know-how are a necessity to exploit the resources as well as to find and capture new markets. Turkmenistan has also been successful in capturing some of the CIS markets. However, hydro-rich Kyrgyz Republic and Tajikistan, despite having the hydro potential and being able to export hydroelectricity, face their own problems in implanting growth strategies into the regional energy market, and in attracting new external investment sources.

Current Position of CAS Energy Market Players

Uzbekistan has significant oil, coal and natural gas reserves. Although the country's oil and gas production has increased in the past decade, Uzbekistan's export potential is hindered by a lack of export routes from landlocked Central Asia. Uzbekistan's only current crude oil export option is to reverse an existing pipeline that brings oil from Russia to Uzbek refineries. However, the relatively small volume of Uzbek oil that will be available for export over the next 10-20 years will probably be insufficient to support the construction of a new export pipeline unless additional volumes are added from other countries in Central Asia. Uzbekistan has signed a memorandum of understanding with Turkmenistan, Afghanistan and Pakistan to build the Central Asia Oil Pipeline (CAOP), which, if constructed, would transport Central Asian oil via Afghanistan to a proposed new deepwater port at Gwadar on Pakistan's Arabian Sea coast. In addition to the COAP, Uzbekistan could tie into the proposed 1,800-mile pipeline from Kazakhstan to China.

The country's gas reserves are estimated at 1,873 billion cbm. Uzbekistan is the third largest natural gas producer in the CIS and one of the top ten gas-producing countries in the world. Since becoming independent, Uzbekistan has ramped up its gas production nearly 33% from 42 billion cbm in 1992 to 56 billion cbm in 2000. Although Uzbekistan's gas production has been on the increase, the country's growing gas consumption (40 billion cbm in 2000) has meant that the amount of gas available for export - approximately 14 billion cbm - has remained relatively steady since 1998. Uzbekistan exports natural gas to Kazakhstan, Kyrgyz Republic, Russia and Tajikistan via the Central Asia - Central Russia Pipeline. Russia and Uzbekistan have reached agreement on Russian payment for Uzbek gas supplies, but frequent non-payment by Kazakhstan and Kyrgyz Republic has been a problem, forcing Uzbekistan to cut gas supplies to these countries to demand payment for gas already received. In an effort to expand and diversify its customer base for gas exports, Uzbekistan has sought to develop alternative routes such as extensions of the Trans Caspian Gas Pipeline (TCGP) for exports to Europe, and the Central Asia Gas Pipeline (CentGas) to export gas to Afghanistan, Pakistan and India. In addition, Uzbekistan is looking to participate in a proposed 5,000-mile pipeline to bring gas from Turkmenistan and Kazakhstan to East China.

Crude oil and condensate production in 2001 amounted to 8 million tons. The refining capacity of the three refineries totals 222,000 bbl/day. Uzbekistan's coal production in 2000 stood at 2.5 million tons, which means a sharp decrease compared to the production of 5.9 million tons in 1991. Uzbekistan's coal reserves amount to 4 billion tons, primarily in the Angren, Baisun and Shargun deposits. Most mining production equipment has virtually exhausted its service life. In response, the government is implementing a program to update the country's coal sector by modernizing production facilities. A project concerning the refurbishment of the Angren coal mine, which is the largest mine, hopes to raise coal extraction to 4.5 million tons and to cut production costs. Uzbekistan plans to upgrade mining operations at its other deposits as well in order to produce a surplus of coal for export in the future.

Uzbekistan's total primary energy consumption has increased from 48.91 million toe in 1995 to 54.61 million toe in 2000. Consumption in 2000 consists of 12% oil products, 84% gas, 2% coal and 1% hydro power, equivalent to 6.2 GWh that came from 25 hydro power plants with a total capacity of 1,710 MW. Per capita consumption is 2.2 toe, which is amongst the highest in the region.

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Kazakhstan has significant petroleum reserves, with estimates ranging from 0.8 to 2.5 billion tons of oil. Kazakhstan produced approximately 39.8 million tons of oil in 2001, this being a sharp increase from the 25.6 million tons produced in 1998. The country's remoteness from world markets, along with its lack of export pipelines, has so far hindered the further growth of exports. Kazakhstan took a major step towards increasing its oil exports in March 2001 with the launch of the 990-mile Caspian Pipeline Consortium (CPC) pipeline, which allows piping of oil directly from the Tengiz field to Russia's Black Sea port of Novorossiisk.

Kazakhstan has proven natural gas reserves of between 1,840 and 1,980 trillion cbm, mainly in the Kashagan, Karachaganak and Tengiz fields, ranking it in the top 20 countries in the world. Natural gas production was increased to about 12 billion cbm in 2000 from 5.9 billion cbm in 1995. However, the lack of internal pipelines connecting the country's natural gas producing areas to the industrial belt between Almaty and Shymkent has hampered Kazakh natural gas production, with many oil producers flaring the natural gas instead of using it. Natural gas consumption still far exceeds the country's domestic production. Kazakhstan currently imports significant shares of its natural gas consumption needs, mainly from Uzbekistan, but with small amounts from Russia as well. In July 2001, KazTransGaz and Uztransgaz, the Uzbek natural gas monopoly, entered into a five-year agreement on natural gas supplies, with Kazakhstan purchasing 1.68 billion cbm in 2002.

With sufficient investment in its natural gas fields and pipeline infrastructure, however, the country could easily become a net natural gas exporter. In August 2001, the Kazakh Ministry for Energy and Mineral Resources approved a 15-year strategy for developing the country's natural gas sector that would increase natural gas production tenfold. Key to the strategy is the development of natural gas reserves at Kashagan, Karachaganak and Tengiz.

Kazakhstan's reserves of coal amount to around 185 billion tons. Despite a contraction of the coal industry since the break-up of the Soviet Union, it remains a major coal producer, consumer and exporter. Between 1992 and 1999, Kazakh coal production declined by 54% from 126.6 million tons to 58.2 million tons. Coal production declined in large part because of non-payment by customers and the lack of incentives to export to Russia (due to high rail tariffs for transporting coal within Russia), as well as due to the collapse of domestic demand. Kazakh coal consumption fell nearly 58%, from 85.5 million tons to 35.8 over this time period.

After nearly a decade of decline, Kazakh coal production is apparently on the rise again. After producing approximately 68 million tons in 2000, Kazakhstan planned to produce 80.5 million tons of coal in 2001. Transportation is the key problem for the coal trade in the Central Asian region, given the great distances that separate markets from deposits. Coal is a high-volume, low-value commodity, ideally suited to rail transportation. At present, Kazakhstan transports coal by railroad to its own internal markets, and exports coal by rail to Russia, Ukraine, the Kyrgyz Republic, and Uzbekistan. But the infrastructure is limited and in poor condition. Negotiations are underway to sell coal to Turkey and Iran, but inadequate infrastructure is a stumbling block.

Total primary energy consumption in Kazakhstan has declined from 63.0 million toe in 1995 to 39.7 million toe in 2000. Consumption in 2000 consists of 29% oil products, 20% natural gas, 49% coal and 2% hydro power.

Energy policy in **Kyrgyz Republic** is heavily weighted toward development of its extensive hydroelectric power resources and expansion of its electricity grid. The country has a very large hydroelectric potential with more than 163,000 GWh per year, of which at present less than 10% is exploited. In addition to the presently installed capacity of 2.95 GW, Kambarata No. 1 with 1,900 MW and No. 2 with 360 MW are considered as the next candidates for expansion. Primary electricity production from hydropower accounts for more than 80% of total primary energy production.

Kyrgyz Republic has also significant deposits of brown coal. Its coal production had been subsidized in the Soviet era, but has declined since independence, from 2.2 million tons in 1992 to 0.17 million tons in 1999. This steep decline has meant that Kyrgyzstan is now a net coal importer. Development of a large mine at Kara-Keche, however, could produce enough to displace imported coal that is being fired at the country's largest thermal power plant in Bishkek. There are presently discussions going on with the German KfW about support for a detailed investigation of the possibility for increased use of local brown coal.

The proven crude oil reserves are currently only 5.7 million tons. Estimates of total reserves - as yet unproven - in the Fergana valley and the depression at Chuy range up to 414 million tons. Current oil production is only 100,000 tons per year. Kyrgyz Republic has estimated natural gas reserves of about 5.7 billion cbm, but these are difficult to exploit. Natural gas accounts for more than 20% of the country's total energy consumption. Kyrgyzstan consumed 0.67 billion cbm of natural gas in 2000, almost all of which came from imports. Its own natural gas production in 1999 was a mere 0.01 billion cbm.

Total primary energy consumption has increased from 2.38 million toe in 1995 to 2.77 million toe in 2000. Consumption in 2000 consists of 25% oil products, 21% gas, 20% coal and 33% hydro power. This is the highest share of hydropower in total primary energy consumption in all Central Asian Countries. Consumption of primary energy amounts to only 0.56 toe per capita. Together with Tajikistan, this is the lowest value of all countries in the region.

Tajikistan is endowed with an enormous hydro power potential that is the major primary energy resource. Total hydropower reserves amount to more than 300,000 GWh, of which presently only about five percent are exploited. In 2000, 92% of the total electric power was generated by hydro plants. Completion of the Rogunsk (3,600 MW) and Sangtuta (670 MW) hydro power plants are the next steps for exploitation of hydropower and considered as priorities by the Tajik Government. Construction of these two power plants had started even before independence. Furthermore,

the Tajik government is resuming a program to build 15 small hydropower plants. A start has been made on supplying equipment for five of these with a total capacity of 634 MW. Apart from hydropower, proven primary energy reserves are quite limited. The country has in addition natural gas reserves of just 5.7 billion cbm.

Tajikistan has a very small oil industry. In 2000, it produced approximately 200,000 tons of crude oil, while the consumption of petroleum products stands at 1,400,000 tons. Tajikistan has no oil refineries. Most of the imported oil products come from Uzbekistan. Domestic gas production was 0.068 billion cbm in 2000. Tajikistan's annual consumption of 1.16 billion cbm forces the country to rely heavily on natural gas imports from Uzbekistan and Turkmenistan. Tajikistan has tried to increase its own gas production by exploratory drilling in the Khatlon region in 2000. Apparently, some of the drilling has been successful enough so that interest has been expressed by China in future drilling in Tajikistan.

Coal production in Tajikistan has plummeted by 90% since the country's independence from 228,000 tons to just 22,000 tons in 2000. An important reason for reduced coal consumption is the switch of residential consumers from coal to electricity for heating after the increase in coal prices. The same holds true for oil products.

Tajikistan's total primary energy consumption decreased from just below 8 million toe in 1991 to 2.6 million toe in 1995, mainly as a result of a substantially reduced level of economic activity. This also led to an increased share of the residential sector in total consumption as compared to 1991. Primary energy consumption increased again to 3.74 million toe in 2000. Primary energy consumption in 2000 is accounted for by 39% oil products, 28% gas, 2% coal and 32% hydro power, the latter being a high value by any standard. Per capita primary energy consumption amounts to 0.58 toe.

Turkmenistan's primary energy reserves consist mostly of gas. Proven natural gas reserves amount to approximately 2.8 trillion cbm. Although the country's gas sector is not fully developed and output dropped throughout the 1990s, Turkmenistan still produced 22.4 billion cbm of gas in 1999, rebounding from 1998 when Turkmenistan, locked in a pricing dispute with Russia over the export of its gas, produced a low of 13.2 billion cbm. With high world gas prices and a Turkmen-Russian agreement on Turkmen gas exports, the country's gas production soared up to 47 billion cbm in 2000. 34 billion cbm (72%) of the gas production was exported, with around 25.7 billion cbm sent to Russia, 5 billion cbm to Ukraine and 3 billion cbm piped to Iran. Gas exports in 2000 were thus four times as high as in 1998.

In order to further increase its exports and reach its full potential, Turkmenistan must solve the problem of getting its gas to consumers and getting paid in hard currency. The country has been unable to capitalize on its gas wealth because it lacks a pipeline to transport the gas to worlds markets. Russia holds a virtual monopoly over Turkmenistan's gas export routes. As part of its strategy to increase its natural gas exports, Turkmenistan is developing alternatives to Russia's pipeline network. The most important proposed project is the 1,020-mile Trans-Caspian Gas Pipeline (TCGP), which would run from Turkmenistan under the Caspian Sea to Azerbaijan, through Georgia, and then to Turkey. The pipeline's initial gas throughput would be 15.8 billion cbm/year, eventually rising to 30 billion cbm/year. Total costs of the pipeline are estimated at around US$ 2 billion, so that substantial foreign investment would be required for the project.

Turkmenistan produced 8.02 million tons of oil and oil condensate in 2001, which was 12% more than in the previous year. The country has announced plans to increase oil production to more than 10 million tons per year, with additional output due to come from newly developed wells in the west of the country. Under a 10-year program the country aims to raise crude oil production to nearly 50 million tons per year. To achieve this, however, substantial foreign investment in the country's oil infrastructure will be needed. While Turkmenistan has attempted to ease restrictions on foreign investment, many obstacles still exist that might distract foreign investors.

Turkmenistan's total primary energy consumption increased substantially from 7.3 million toe in 1995 to 13.1 million toe in 2000. With shares of 11% oil products and 89%

Table 1
Primary Energy Resources in Central Asia

Fossil Fuel Reserves	Unit	Kazakhstan	The Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan	Total
Crude Oil	MTOE	1,100	5.5	1.7	75	82	1,264
Gas	MTOE	1,500	5	5	2,252	1,476	5,237
Coal	MTOE	24,300	580	500	Insignificant	2,851	28,231
Total	MTOE	26,900	591	507	2,327	4,409	34,732
% of Total		77.4	1.7	1.5	6.7	12.7	100
Hydro Potential	GWh/year	27,000	163,000	317,000	2,000	15,000	524,000
	MTOE/year	2.3	14	27.3	0.2	1.3	45.1
% of Total	%	5.2	31.1	60.5	0.4	2.9	100

Source: BP Global Energy Statistics, World Bank Reports

gas in 2000, the consumption pattern is unique. Per capita consumption amounts to 2.42 toe.

However, both Kyrgyz Republic and Tajikistan are quite poor countries, small economies and to compound the problems, are highly indebted. Therefore, in order to pursue their export-led development options, they have recognized the need to attract foreign private investments to the development of these schemes.

Electric Energy Use

The electric energy generation and transmission system in the five countries of Central Asia was formed during the former Soviet Union and adapted to the needs of the wider Soviet power supply system. With the disintegration of the Soviet Union and the formation of new independent states, this system was suddenly confronted with new national borders that did not match the technical system. As a consequence it was necessary to find arrangements for regional cooperation, which is often a difficult undertaking in an environment where newly created states are looking for an independent status in all respects.

Since 1990 there has been a decline in consumption of electricity in all five Central Asian States, although a slight recovery has taken place over the last couple of years. All countries suffered a decline in consumption in the first half of the 1990s. From then on consumption stabilised in most countries except in South Kazakhstan, and at the end of the decade the consumption had increased slightly in both Uzbekistan and in Turkmenistan.

With a GDP per capita of between US$ 160 and US$ 1,230 in 2000, the five Central Asian Republics belong to the group of low income and lower middle income countries. This

Electricity in Central Asian Republics

The electricity grids of the Kyrgyz Republic, Tajikistan, Uzbekistan, South Kazakhstan and Turkmenistan belong to the Central Asian Power System (CAPS) of the former Soviet Union. They are adequately interconnected by a 500 kV transmission system enabling power exchange among the grids. They have also interconnections at 220 kV and lower voltage levels. Even after the dissolution of the Soviet Union, the synchronous operation of the grids continue, and the countries have established a Central Asian Power Council, which is responsible for preparing schedules for power exchange at three month intervals. Central dispatch is handled from Tashkent by the Unified Dispatch Center (UDC), called Energia, based on these schedules and the need to balance the systems in real time and regulate voltage and system frequency. Uzbekistan generates 52 percent of the total power in the CAPS, Tajikistan 16 percent, the Kyrgyz Republic 15 percent, Turkmenistan 11 percent, and southern Kazakhstan 6 percent. By and large, most of the power exchanges are based on the IGIAs concluded among the states for the water discharges from the Toktogul reservoir and Naryn cascade of HPPs in the Kyrgyz Republic. Turkmenistan is not involved in these types of exchanges, arising from IGIAs relating to Syr Darya basin.

The volume of power exchanges among these states declined by 70% during 1990-2000, even though the overall consumption level was about 80% of that in 1990. This decline in exchanges is attributed to the internationalization and monetization of the energy trade, as well as the energy self sufficiency policy followed by each country, upon attaining independence .

World Bank Report, (Gray book)

Table 2

Shifts in Electricity Trade in Central Asian Power System 1990-2000

Electricity Trade in 1990 (GWh)

			Imports				
Exports	Kazakhstan	The Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan	Outside CA*	Total
Kazakhstan	--	277	0	0	310	0	587
The Kyrgyz Republic	697	--	0	0	2,383	0	3,080
Tajikistan	0	324	--	0	2,344.2	0	2,668.2
Turkmenistan	0	0	0	--	6,066	0	6,066
Uzbekistan	8139	0	3,927	946	--	0	13,012
Outside CA*	0	0	0	0	0	--	0
Total	8836	601	3,927	946	11,103.2	0	

Electricity Trade in 2000 (GWh)

			Imports				
Exports	Kazakhstan	The Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan	Outside CA*	Total
Kazakhstan	--	0	0	0	0	0	0
The Kyrgyz Republic	1,252.9	--	154.4	0	1,925.6	0	3,332.9
Tajikistan	0	125.7	--	0	243.9	0	369.6
Turkmenistan	34.8	0	818.7	--	67.7	0	921.2
Uzbekistan	0	194.6	728.8	32.5	--	0	955.9
Outside CA*	2,224.3	0	0	0	0	--	2,224.3
Total	3,512	320.3	1,701.9	32.5	2,237.2	0	

World Bank Report, 2003

means that local resources for enhancement of the infrastructure system are generally quite limited. In the power sector, this is exacerbated by the fact that power tariffs are very low and well below long-run marginal costs, commercial losses are high and revenue collection rates are low. Power utilities thus cannot create the revenues they require to operate the system efficiently and in particular to maintain it at the required standards.

Generally there is a close interrelation between GDP and energy consumption, although causal factors also include population growth and per capita consumption. Predictions of GDP are often difficult, and as an alternative future demands could be forecast by extrapolation of past trends. Two such forecasts estimate that by 2025 the annual electricity demand in Central Asia will increase by between 35 TWh and 78 TWh in one case and by 41 TWh in the other. These represent percentage increases of 37-82 % and 42% respectively. Past and predicted future energy use in the region is summarised in Table 3.

Table 3
Energy Use in Central Asia (TWh[1])

Year	Kazakhstan[2]	KyrgyzStan	Tajikistan	Turkmenistan	Uzbekistan	Total
1990	25.9	9.2	19.3	9.6	54.0	118.2
1995	14.7	10.9	15.4	8.3	46.1	95.6
2000	9.2	11.8	15.5	8.9	48.1	93.7
2010[3]	11.8	15.1	19.8	11.4	61.6	120

1. 1 TWh = 10^9 kWh
2. South Kazakhstan only
3. 2.5% annual growth rates assumed for all countries
- Power Transmission Modernisation Project in the Central Asia Region – ADB project TA 5960-RETA

Current and Future Generating Capacity

The electricity demand forecasts for 2025 suggest the need for net capacity increases of between 5,300-12,000 MW in one case and around 10,000 MW in the other. However, since some existing capacity will have to be decommissioned because of age, the actual new/replacement capacity required in this period is likely to be in the order of 12,000–18,000 MW (see Table 4).

Table 4
Forecast of Required Electrical Generating Capacity

	2000	2025 Additional Net Capacity Requirement	
	Net capacity	Forecast (1)	Forecast (2)
Capacity (‘000 MW)	18.9	5.3 - 11.9	9.8
Capacity requirement (%)		28 - 63%	52%

(1) Power Transmission Modernisation Project in the Central Asia Region – ADB project TA 5960-RETA
(2) Extrapolation of 1996-2000 data, GEF AGENCY of the IFAS

The CAS’s energy resources are sufficient to meet projected demand, but mobilizing the investment required capital and converting resources into available supplies, will be depend on the ability of the energy sector to compete with other sectors of the economy. In this case , the energy-investment challenge is heightened by the fact that capital needs in the next 15 years will be much larger, in real terms, than over the past 15 years. In the case of electricity, the investment requirement will be nearly three times greater. This makes it all the more important that investment conditions in the energy sector are right to attract the required amounts of capital. According to international experts, the electricity sector dominates the investment needs picture: power generation, transmission and distribution will absorb almost 60% of total energy investment needs.

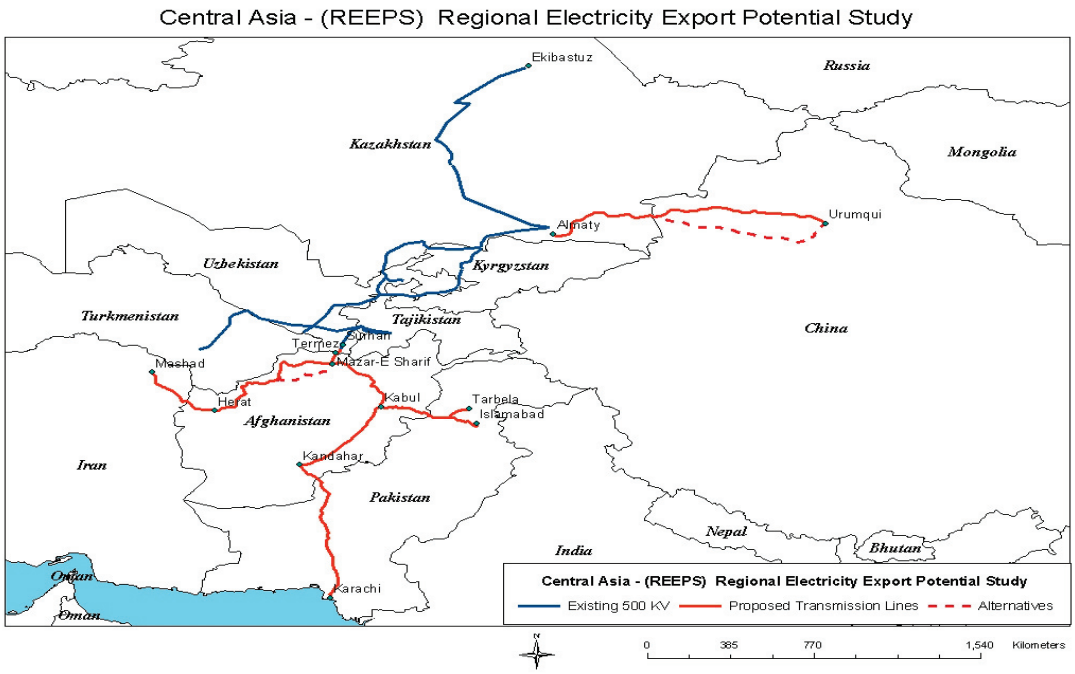
Central Asia States and its Neighboring Electricity Export Markets

Most governments will continue to seek greater private participation in the energy sector. Some governments will continue to finance oil and gas investment directly or through their national companies, but they will often have to pay more for their capital than major international companies. Governments everywhere will have to pay attention to how the policy, legal and regulatory framework affect investment risk and how barriers to investment can be lowered, if this investment is to come from outside the government.

If the Governments of the CAS would like to promote competitive investments into the energy market of the region , they also need to create more stable, transparent and predictable regulatory conditions in order to ensure that market structures do not impede investments that are economically viable. Some compromises will be necessary, for example, on long-term take-or pay contracts for exported electricity.

In regard to the markets for electricity from Central Asia, there are some real possibilities: Iran is experiencing a shortage during its peak (summer, which complements well with the Central Asian Power systems which are all winter-peak systems), and the opening up of Afghanistan, with whom CAS’s not only share a long border but have transmission links since the times of the Soviet Union; and there would be a need for additional power within CAS’s – in Kazakhstan and possibly Uzbekistan.

Power supply to northern Afghanistan was interrupted some five years ago due to non-payment of debts. Since then,



World Bank Report, 2004

some sections of the transmission lines and substation equipment in Afghanistan have been destroyed. During the discussions, the relevant agencies in Uzbekistan and Tajikistan expressed their willingness to participate in the economic development of Afghanistan, and resume power supply when the technical and administrative problems are resolved. It would thus be possible to resume power supply at least to the northern Provinces of Afghanistan, namely to the Mezari Sharif Region from Uzbekistan and the Kunduz Region from Tajikistan possibly as soon as this year 2004. According to the World Bank's Central Asia Regional Electricity Export Potential Study, Afghanistan energy market has a vital and actual need, but the amount of energy/electricity is small. There may also be a payment problem over next 10 years. However, under the World Bank's encouragement, it may be possible to use Donors Trust Funds.

The best approach is to supply electricity in exchange for right-of-way to deliver electricity to Iran and Pakistan. Pakistan and Iran are real markets. Both have asked the World Bank to help create an electricity trade with the Central Asia region. Another big player is Russia, which is interested, under certain circumstances, in importing power from Central Asia. This year Russia has made a start with some imports from Kyrgyz Republic.

Another option for a future market comes from China which has a huge growth in demand and current shortages. Targets are for 356,000 MW installed capacity to triple by 2020 and the idea to "Develop the West" Initiative focuses on Xinjiang, but Xinjiang has enough capacity and gas resources, and in this case only internal (China) transmission can make the necessary linkage to a huge market.

The Central Asian energy market product, electricity, needs to be competitive with importing countries' electricity and local generation costs. The generation cost plus transmission costs should be less than US cents 5.6/kWh in Pakistan and US cents 5/kWh in Iran. Also there is a need to ensure year-round supply.

These two conditions can perhaps be met with: (a) a combination of surpluses from existing generation plus new power: and (b) formation of a Water-Energy Consortium . The recent World Bank Study outlines the way to benefit the whole region, and gives cost estimates of the various options.

Summary

The trade in energy resources in Central Asia States is hampered by a number of factors that include political, technical, institutional and commercial components. A prime obstacle is the fact that for virtually all governments in the region, with their background in the FSU, "self-sufficiency" has been an economic policy goal and most of the countries of the region have had programs of import substitution. This policy has been extended to electricity. The effect is that some states are generating electricity using high value fossil fuels rather than importing electricity from neighboring countries with surplus electricity generated from renewable resources.

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