

## 1.2 Formation of the Study Team

Table 1.2-1 shows the name and task of members of the JICA Study Team.

Table 1.2-1 Formation of The JICA Study Team

<b>Name</b>	<b>Task</b>
Kenji MIKATA	Team Leader Overall Planning of Power Generation System Gas Turbine and its Auxiliaries
Hideyuki OKANO	Sub-Team Leader Steam Turbine and Plant Auxiliaries
Toshio SHIOMI	Boiler and Plant Auxiliaries
Hideya KANO	Civil and Architectural
Sachio KOSAKA	Power Plant Management Construction Plan Project Cost Estimates
Teizo AKIZUKI	Economic and Financial Analyses
Tetsuya USHIYAMA	Environmental Impact Assessment
Tadayoshi WAKITA	Control and Monitoring System
Shoichi KIMURA	Electrical System
Kenji HIRAMATSU	CDM
Kiyoshi NOMURA	Power System Analysis
Takashi CYUJYO	Power System Analysis
Misaki KITAKA	Administration and coordination

### **1.3 Technology Transfer**

#### **1.3.1 Technology Transfer through On-Site Study Works**

Based on the contents of Scope of Work, the cooperative on-site works between SJSC "Uzbekenergo" and the Study Team will be carried out during the study period. Such a manner will enable technology transfer smoothly and effectively. The technical transfer through on-site works is focused on the following technologies:

- (1) Preparation of tender documents for international competitive bidding (general conditions of contract, particular specifications, technical specifications, etc)
- (2) Modern combined cycle power plant
- (3) The latest technologies about gas turbine, steam turbine and HRSG (Heat Recovery Steam Generator)
- (4) DCMS system for operation of modern combined cycle power plant
- (5) Environment impact evaluation for power plant
- (6) Operation and maintenance of power plant
- (7) Financial evaluation of new power plant
- (8) CDM (Clean Development Mechanism)
- (9) Power System Analysis
- (10) Other items requested by SJSC "Uzbekenergo"

#### **1.3.2 Technology Transfer through Seminar**

The Technology transfer seminar will be held at the site during the Fifth On-site Study. The contents presented in the seminar will include entirely the above-mentioned technologies and are shown in Table 1.3-1.

#### **1.3.3 Counterpart Training**

The counterpart training will be provided with one (1) trainee for about two (2) weeks during fiscal year of 2002 and four (4) trainees for about three (3) weeks during fiscal year of 2003. The training program is shown in Tables 1.3-2 and 1.3 -3 respectively.

Table 1.3-1 Program of Technology Transfer Seminar

Date	Time	Contents of Technology to be transferred.	Name of Lecturer	Participants
November 5th	10:30-10:35	Welcome Speech	SJSC "Uzbekenergo"	SJSC "Uzbekenergo" DC "TashTPP" SC "Teplioelektroproekt" Other Interested Organizations
	10:35-10:40	Opening Speech	JICA	
	10:40-11:00	Outline of Project	SJSC "Uzbekenergo"	
	11:00-11:40	Outline of Tender Documents	Mr. Akizuki	
		Explanation of Contractual Words in General Conditions of Contract		
	11:40-11:55	Tea Break		
	11:55-13:00	Evaluation for Pre-qualification and Bidding (Instruction of Evaluation Method of JBIC)	Mr. Mikata	
	13:00-14:00	Lunch Time		
	14:00-15:00	Current Status of CCPP	Mr. Mikata	
	15:00-15:15	Tea Break		
15:15-16:30	Technology of 1,300°C Class Gas Turbine	Mr. Mikata		
November 6th	10:30-11:15	Heat Recovery Steam Generator	Mr. Shiomi	
	11:15-11:30	Tea Break		
	11:30-12:45	Steam Turbine for CCPP	Mr. Okano	
	12:45-13:30	Air Cooled Generator	Mr. Kimura	
	13:30-14:30	Lunch Time		
	14:30-15:15	DCS System and Operation of CCPP	Mr. Wakita	
	15:15-15:30	Tea Break		
	15:30-16:30	Operation and Maintenance of CCPP	Mr. Kosaka/Wakita	
	10:30-11:15	Improvement Plan of TashTPP Existing Equipment	Mr. Kosaka	
	11:15-11:30	Tea Break		
November 7th	11:30-12:15	Explanation of JBIC Environmental Guidelines	Mr. Ushiyama	
	12:15-13:00	EIA Summary and Results of Public Hearing	SJSC "Uzbekenergo"	
	13:00-14:00	Lunch Time		
	14:00-14:45	Present and Future Economic and Financial Situation of DC "TashTPP"	Mr. Akizuki	
	14:45-15:00	Tea Break		
	15:00-15:45	Results of Analysis Study of Power Network System	Mr. Nomura	
November 7th	15:45-16:30	Outline of Project Design Documents as a CDM Project	Mr. Hiramatsu	
	16:30-16:40	Closing Speech	SJSC "Uzbekenergo"	

Table 1.3-2 Schedule for Counterpart Training in Japan (Fiscal 2002)

Date	Time	Training Program	Place of Training	Stay
March 12 (Wen)		Arrival		Tokyo
March 13 (Thu)		Briefing and Program Orientation	TIC	Tokyo
March 14 (Fri)	AM	Lecture : Outline of TEPCO and TEPCO, Electric Power Situation of Japan	TEPCO	Tokyo
	PM	Lecture : Combined Cycle, Countermeasure for Environment		
March 15 (Sat)		Holiday Move : (From Tokyo to Kyoto)		Kyoto
March 16 (Sun)		Holiday Move : (From Kyoto to Himeji)		Himeji
March 17 (Mon)	AM	Visit : KEPCO Himeji Thermal Power Plant	KEPCO	Tokyo
	PM	Visit : Gas Turbine Manufacturere's Work Move : (Himeji→Tokyo)		
March 18 (Tue)	AM	Visit : TEPCO Shinagawa Training Center	TEPCO	Tokyo
	PM	Visit : TEPCO Kawasaki Thermal Power Plabt		
March 19 (Wen)		Visit : TEPCO Yokohama Thermal Power Plant	TEPCO	Tokyo
March 20 (Thu)		Visit : TEPCO Futtsu Thermal Power Plant	TEPCO	Tokyo
March 21 (Fri)		Holiday		Tokyo
March 22 (Sat)		Holiday		Tokyo
March 23(Sun)		Holiday		Tokyo
March 24 (Mon)	AM	Visit : TEPCO Shinagawa Thermal Power plant	TEPCO	Tokyo
		Visit : TITC		
March 25 (Tue)		Evaluation of this training	TIC	Tokyo
March 26(Wen)		Return to Uzbekistan		

Remarks :. 1. TIC : Toky International Center

2. TEPCO : Tokyo Electric Power Service Co., Ltd.

3. KEPCO : Kansai Electric Power Company

4. TEPCO : Tokyo Electric Power Company

Table 1.3-3 Schedule for Counterpart Training in Japan (Fiscal 2003)

Date	Time	Contents of Training	Place	Stay
Nov. 26 (Wen)		Arrival		Tokyo
Nov. 27 (Thur)		Briefing, Program Orientation	TIC	Tokyo
Nov. 28 (Fri)	AM	Lecture : Outline of Tashkent Thermal Power Plant Modernization Project, Combined Cycle, Environmental Mitigation	TEPSCO	Tokyo
	PM	Lecture : Gas Turbine, HRSG, I&C		
Nov. 29 (Sat)		Holiday	TIC	Tokyo
Nov. 30 (Sun)		Holiday	TIC	Tokyo
Dec. 1 (Mon)		Move : Tokyo →Nagasaki		Nagasaki
Dec. 2 (Tue)	AM	Lecture and Inspection : Construction of HRSG, etc	HRSG Manufacturer's Work	Fukuoka
	PM	Move : Nagasaki → Fukuoka		
Dec. 3 (Wen)	AM	Move : Fukuoka → Himeji	KEPCO	Himeji
	PM	Visiting : KEPCO HIMEJI TPP No.5,6		
Dec. 4 (Thur)		Lecture : Construction of Gas Turbine, etc	Gas Turbine Manufacturer's Work	
Dec. 5 (Fri)	AM	Inspection : Production of Gas Turbine, etc.	Ditto	Tokyo
	PM	Move : → Tokyo		
Dec. 6 (Sat)		Holiday		Tokyo
Dec. 7 (Sun)		Holiday		Tokyo
Dec. 8 (Mon)		Training at TPP : Conventional type TPP (at TPP which is under periodical inspection)	TEPCO	Tokyo
Dec. 9 (Tues)		Ditto	TEPCO	Tokyo
Dec. 10 (Wen)		Training at TPP : Combined Cycle PP (at TPP which is under periodical inspection)	TEPCO	Tokyo
Dec. 11 (Thurs)		Ditto	TEPCO	Tokyo
Dec. 12 (Fri)		Ditto	TEPCO	Tokyo
Dec. 13 (Sat)		Holiday	TIC	Tokyo
Dec. 14 (Sun)		Holiday	TIC	Tokyo
Dec. 15 (Mon)		Exchange of Opinions	TEPSCO	Tokyo
Dec. 16 (Tue)		Assessment Meeting	TIC	Tokyo
Dec. 17 (Wen)		Departure		

- Remarks :. 1. TIC : Tokyo International Center
2. TEPCO : Tokyo Electric Power Service Co., Ltd.
  3. KEPCO : Kansai Electric Power Company
  4. TEPCO : Tokyo Electric Power Company

**CHAPTER 2    GENERAL STATUS OF  
THE REPUBLIC OF  
UZBEKISTAN**

**THE DETAILED DESIGN STUDY FOR  
MODERNIZATION OF TASHKENT THERMAL POWER PLANT  
IN THE REPUBLIC OF UZBEKISTAN**

**FINAL REPORT**

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## CHAPTER 2 PRESENT STATUS OF THE REPUBLIC OF UZBEKISTAN

### 2.1 Overview of the Republic of Uzbekistan

Uzbekistan, after its history over millennia, won independence from the ex-Soviet Union in 1991. The nation is now becoming open to the world with a view to developing a democratic society with a free market economy.

Uzbekistan is a nation of 447,400 km<sup>2</sup> situated in the middle of Central Asia, at the crossroad of ancient trade routes. With a population of over 24 million, the nation is the leading country of Central Asia in terms of economic and geopolitical influence. Its capital - Tashkent - a city with a 2000 year history, is the largest city in the region (about 2.3 million people), and is functioning as a national hub for political, industrial, financial and cultural activities. The socioeconomic indexes of the state are shown below.

Population growth:	2.3%(1995)
Infant mortality rate:	43 per 1,000 births
Average life:	male 70.7 female 64.3
Adult literacy rate:	male 99.6% female 99.8%

Uzbekistan bordering all the other countries in Central Asia is playing an important part of the traffic and electric power network. About three-fifths of the land is desert steppe broken by irrigated, fertile oases along the banks of Amu-Darya and Syr-Darya rivers. Uzbekistan has mild winters and no more than 200 mm of rainfall per year, but its hot, dry summers in May through October create excellent growing conditions for warm weather crops such as cotton, tobacco, fruits and vegetables.

Uzbekistan has twelve regions. The fertile Ferghana Valley, with an odd shaped tail projecting eastward from the main body of the country, boasts six million people including large minorities of ethnic Kyrgyz, Tajiks and Russians. In the valley lying in three countries of Uzbekistan, Tajikistan and Kyrgyz Republic, a multinational economic zone has been formed. Populous centers in the region include Namangan and Andizhan with 0.33 and 0.3 million residents respectively. The Ferghana Valley produces a major share of the country's

cotton and grain crops and contains numerous manufacturing plants, as well as natural gas and oil fields.

The central region of Uzbekistan is mostly desert, but with many oases along the Zarafshan River, Qarshi Steppe and Sukhandarya River. This region is best known for the ancient Silk Road cities of Samarkand and Bukhara, which together claim more than 600,000 inhabitants and comprise the heart of Uzbekistan's tourism industry. Central Uzbekistan is also home to the mining center of Navoi and contains the majority of Uzbekistan's gold and other mineral deposits, as well as the largest natural gas and oil fields. Irrigation along the Zarafshan and other rivers provides a strong basis for agriculture.

Uzbekistan's human resources potential is one of the highest in all of Asia, the country's advantage being the highest level of overall education and skills of the labor force. The country's ethnic makeup is Uzbek of 74.7%, Russian of 6.5%, Tajik of 4.8%, Kazak of 4.1% and others of 10.1%. The official state language is Uzbek, though Russian is more commonly spoken. The population density is 50.4 persons/km<sup>2</sup>. More than 60% of the population are living in rural areas. The recent population growth is 2.3% that is very higher than the global average. According to the current United Nations Development Program (UNDP), the population is expected to reach 25 million by 2000. This high growth in population, i.e. increase in the population of young generation, ensures Uzbekistan's continued status as the largest labor and consumer market in Central Asia.

The economy of the nation has been reviving for the past several years. Among the CIS countries, Uzbekistan stands out as the country with the most stable transition record, free from sharp slumps and extremities of poverty and inflation. Uzbekistan is the world's second largest exporter of cotton. In addition, its abundant mineral resources place it among the most attractive countries for international investors in the mining sector. Uzbekistan ranks among the top 10 producing countries in the world in the sphere of extraction of many non-ferrous metals. It holds the seventh place in the rank of gold producers, boasting over 70 tons of production a year. The natural gas resources are the world's tenth place in the rank of production.

The Government's privatization policies that have started soon after independence are still expanding: 82.7% of all enterprises belong to the non-state form of ownership, which produce about 70% of the nation's GDP.

Uzbekistan, now pursuing an "open-door" policy in attracting foreign direct investment, is truly an attractive site for investors.

## 2.2 Situation of Politics

### 2.2.1 Overview

In the process of the Soviet Union's collapse beginning in the late 1980's, the Soviet Republic of Uzbekistan declared an adoption of republicanism in June 1990, and then declared its independence on August 31, 1991 after the failure of the Moscow coup. With the collapse of the Soviet Union in the end of the year, Uzbekistan won actual independence, and adopted a new constitution on December 8, 1992.

The present president, Islam Karimov, has started his career as the present since March 1990 after taking the position of the leader of the former communist party since 1989.

He was elected the first President of the Republic of Uzbekistan by the direct election in December 1991 soon after independence. Then his presidency was decided to be extended to year 2000 by the national referendum in April 1995. In the direct presidential election in January 2000, he won reelection by polling as many as 92% of the total votes.

The People's Democratic Party, former Communist Party, renamed in August 1991, is still keeping its strongest power to support Karimov Administration. The leader of the party is Karimov himself. In December 1994, the post-independence first congress members election was held. The People's Democratic Party and Homeland Progress Party won the election.

The next presidential and congress members elections are slated for January 2005 and December 2004 respectively.

After the collapse of the Soviet Union, Uzbekistan has been going its own way while continuing to emphasize the importance of renovation and national control, unlike other CIS nations such as Kazakstan and Kyrgyz who followed IMF recommendations to promote economic liberalization and structural reforms. During a period from the collapse of the Union to 1996, most of CIS nations had suffered from serious economic depressions, while Uzbekistan could manage to suppress the reduction of GDP to a minimum level thanks to the "gradual renovation" policies.

The President's strong leadership and "gradual renovation" policies since independence have been contributing to keeping its political and economic situations relatively stable. Karimov Administration is robust.

### 2.2.2 Political Structure

Official name: Republic of Uzbekistan

National legislature:	The unicameral legislature, the 250-member Supreme Council, has little independent power. The term of membership is five years. The last election for congress members was held in December 1999. The next election is slated for December 2004.
Electoral system:	Universal suffrage over the age of 18
President:	Islam Karimov Born in 1938. He has started his career as the present of the Republic of Uzbekistan since March 1990 after leading the former Communist Party during a time before independence. After the declaration of independence in August 1991, the Communist Party was renamed as the People's Democratic Party, and he was reelected as the leader of the party. After winning the post-independence first direct presidential election in December 1991, his presidency was decided to be extended to year 2000 by the national referendum in April 1995. And he won the direct presidential election in January 2000. The present presidency expires in January 2005.
National Government:	Cabinet-members parliamentary system, headed by the prime minister, who is nominated by the President.
Main political parties:	People's Democratic Party, Homeland Progress Party, National Revival Party, Justice Party, People's Unity Movement Party, etc.
Cabinet members:	Chairman of Supreme Assembly Erkin Halilov Prime minister: Otkir Sultonov First deputy prime minister Kozim Tolaganov Deputy prime minister & minister for economics: Rustam Azimov Deputy prime minister & minister for Energy & Fuel: Valeriy Atayev Deputy prime ministers: Anatoliy Isayev Uktam Ismailov Rustam Yunosov Mirabror Usmonov Hamidulla Karamatov Elyor Ganiyev
Key ministers	Agriculture & Water Resources Abduvohid Jorayev

Communications	Fahtullah Abdullaev
Culture	Hairulla Jurayev
Defense	Kodir Ghulomov
Education:	Risboy Jorayev
Emergency Situations	Bakhtiyor Subanov
Finance:	Mamarizo Normuradov
Foreign affairs:	Sodiq Safayev
Foreign economic relations:	Elyor Ghaniyev
Health:	Feruz Nazirov
Higher & Secondary Specialized Education	
	Saidakhror Ghulomov
Internal Affairs:	Zokirjon Almatov
Justice:	Abdusamad Palvan-Zade
Labor & Social Security:	Okiljon Abidov

### 2.2.3 Diplomacy

Uzbekistan is trying to go out of the sphere of Russian influence while maintaining a good relationship with the former parent nation. The relationship between Uzbekistan and western nations is relatively good. The President recently visited many western nations including the USA, Germany and UK to strengthen the diplomatic relationship. Relationship with Japan has been deepened through various activities in the government and private levels, e.g. private economic assistance survey missions and the Japan-Uzbekistan joint economic committee. President Karimov visited Japan in May 1994. Sultanov, the prime minister of Uzbekistan, visited Japan in March 1999. Komura, the minister of foreign affairs of Japan, visited Uzbekistan in May 1999.

Uzbekistan experienced racial disputes and violence in the past, though no large ones have occurred since a ban on Islamic extremists activities.

In April this year, a summit meeting of the four Central Asian nations was held in Tashkent. The meeting adopted a joint declaration to cooperate each other to defend against the threat of antigovernment extremists.

### 2.2.4 Development Assistance from Japan

Japan is positive for assisting Uzbekistan in developing its human and financial resources

to support its efforts to foster democracy and free market economy.

Japan's supports for Uzbekistan, e.g. in the field of human resources development (by accepting trainees and dispatching trainers) and technical transfer, started before Uzbekistan's participation in DAC (Development Assistance Committee) in January 1993, and have been continuing.

Loan-based financial aids from Japan for developing the infrastructure for transportation and telecommunication has started in 1995 and reached about 34 billion yen as of 1998 in the cumulative amount of loans. Grants-in-aid from Japan, e.g. in the fields of medical service, food security and culture, has reached about 7 billion yen as of 1998. Technical cooperation from Japan includes the development of human resources preparing for market-oriented economy, environment and public service; and smooth transition into a free market economy. Japan's assistance includes also projects concerning water supply at the Aral Sea coastal areas with a view to protecting the environment, natural resources development and transportation infrastructure. The total amount of aids from Japan is far larger than those from other donor nations, which indicates how much Japan contributes to the development of Uzbekistan. Table 2.1-1 shows a list of aids from Japan to Uzbekistan.

Table 2.1-1 The Development-Assistance Cooperation Actual Result by the Fiscal Year and by Form

Unit : 100 million yen

Fiscal year	Loan-based financial aids	Grants-in-aid	Technical cooperation	Total
1993	—	—	1.1 (Training acceptance, specialist sending, development investigation, others) member	1.1
1994	—	16.0 (Medical appliance maintenance, non-project assistance, etc.)	3.5 (Training acceptance, specialist sending, development investigation, others) member	19.5
1995	127.0 (District communications network expansion plan)	18.3 (Mother-and-child hospital medical equipment maintenance, Non-project assistance, others)	4.3 (Training acceptance, specialist sending, development investigation, others) member	149.6
1996	216.3 (Railroad passenger transport capacity)	14.0 (Road construction equipment maintenance plan,	6.1 (Training acceptance, member	236.4

	reinforcement and rocal 3 airport modernization plan)	Food production increase Assistance, others)	specialist sending, development investigation, others)	
199 7	—	11.3 (Mother-and-child hospital medical equipment maintenance, Food production increase Assistance, others)	5.8 (Training member acceptance, specialist sending, development investigation, others)	17.1
199 8	—	9.6 (Mother-and-child hospital medical equipment maintenance, Food production increase Assistance, others)	3.5 (Training member acceptance, specialist sending, development investigation, others)	13.1
Tota 1	343.3	69.2	24.3	436.8

Source : Ministry of Foreign Affairs ODA white paper

## 2.3 Situation of Economy

### 2.3.1 Overview

Relying on considerable natural resources and a highly educated labor force, the Government of Uzbekistan has attempted to craft a mechanism for economic development combining an emphasis on preserving macroscopic stability and industrial capacity with efforts to improve the level of foreign trade and investment.

Soon after declaring independence, the Government of Uzbekistan established economic policies that were unequivocally opposed to the "shock therapy" approach, favoring instead efforts to support state enterprises and shield consumers from inflation through a combination of state subsidies, strict price controls and periodic wage increases. Initially, these policies enabled the government to hold the 1991-1994 GDP decline to 17% compared to a CIS average near 40%. However, this conservative approach became increasingly untenable in 1993, following Uzbekistan's expulsion from the Russian ruble zone. Faced with mounting economic problems accented by soaring inflation of the transitional currency known as the "sum coupon," the government began a genuine economic reform program including stricter fiscal policies, freeing of prices on most commodities, cooperation with international financial institutions, modest steps toward privatization, overtures to foreign investors and institution of a permanent currency, the sum.



After instituting these policies, the government made impressive gains against inflation, an end-year inflation rate of 27.6% for 1997, down from 64.4% at the end of 1996. Similar progress was made in preserving the GDP which went from a 4.2% drop in 1994 to a 5.2% growth in 1997. Tables 2.1-2 and 2.1-3 show the real GDP (change in percentage compared to the previous year) and contribution of various sectors to the GDP in 1993 to 1997. In 1997, each sector's contribution to the GDP in real terms is 26% by agriculture, 17% by manufacturing, 8% by trade, 8% by construction, 6% by transportation and telecommunication and 24% by others. Agriculture accounts for the largest origin of GDP.

Table 2.3-1 Real GDP Growth (In percent over previous year)

Year	1995	1996	1997	1998	1999
Agriculture	2.0	-7.0	5.8	4.0	6.0
Industry	-5.6	1.7	2.2	2.3	1.0
Transport and communication	-5.0	-1.0	-1.0	5.0	3.3
Construction	-4.1	0.6	2.6	6.0	3.6
Trade	-6.2	19.5	17.1	10.3	7.3
Other Services	2.3	2.0	4.1	3.0	3.9
Indirect subsidies minus taxes	-0.4	14.1	8.1	4.8	2.9
Total	-0.9	1.6	5.2	4.4	4.1

Source : IMF Staff Country Report No.00/36

Table 2.3-2 Contribution of Nominal GDP at Current Market Prices (In percent)

Year	1995	1996	1997	1998	1999
Agriculture	28	22	26	26	27
Industry	17	18	17	15	15
Transport and communication	7	7	6	6	6
Construction	7	8	8	8	8
Trade	5	7	8	8	9
Other Services	22	23	24	21	21
Indirect taxes minus subsidies	13	14	11	16	15
Total	100	100	100	100	100

Source : IMF Staff Country Report No.00/36

The recent growth of the agriculture, trade and service sectors is similar to the GDP growth, though the manufacturing, transportation & telecommunication and construction

sectors have experienced a growth smaller than that of GDP. However, it should be noted that the energy related sectors have gained a relatively larger growth, though these Tables do not show this trend explicitly. The recent increase in domestic production depends significantly on Government's efforts to promote domestic production of consumer goods. In the past two years, the production of TVs, VTRs and automobiles has quickly increased, while the production of machines (e.g. transformers, tractors and cotton harvest machines), intermediate products (e.g. window glass and cotton fiber) and consumer goods (e.g. refrigerators, cotton cloth, shoes, cleaning detergents and vegetable oil) is flat notwithstanding supports from the government. Table 2.1-4 shows the production of major products of the manufacturing sector in 1993 to 1997.

Table 2.1-4 Production of Selected Industrial Products

Year	Unit	1995	1996	1997	1998	1999
Machinery, raw materials, and intermediate goods						
Paper	1000t	9	11	8	7	6
Cement	1000t	3,419	3,277	3,286	3,358	1,521
Ferrous metal products	1000t	322	423	350	322	133
Mineral fertilizers	1000t	943	1,029	954	897	455
Plastics and synthetic resins	1000t	13	11	10	13	6
thread	1000t	8	6	7	11	6
Compressors	number	784	828	284	111	74
Power transformers	1000kW	780	535	398	284	95
Tractors	1000 sets	4	4	3	3	1
Cotton harvesters	number	1,121	863	1,049	351	97
Cotton sowing machine	number	330	470	411	2,185	-
Steel	1000t	367	466	379	360	147
Window grass	1000 m <sup>2</sup>	2,130	1,499	5,123	3,995	1,243
Cotton fiber	1000t	1,238	1,164	1,125	1,138	476
Consumer goods						
Refrigerators and freezers	Units	18,600	12,700	35,000	16,053	993
Automobiles	Units	3,000	25,400	64,900	54,456	34,500
Television sets	Units	64,900	139,650	268,450	192,468	21,248
Video recorders	Units	25,300	100,000	140,600	50,056	-
Cotton cloth	1000t	456	445	425	311	166
Tricotage products	million units	34	46	50	45	23
Synthetic textiles	1000t	7	3	3	-	-
Socks and hosiery	million pairs	66	68	62	25	10
Shoes	million pairs	6	5	5	5	2
Soap	1000t	9	7	4	5	1
Detergent	1000t	7	3	-	3	1
Vegetable oil	1000t	340	232	237	280	163

Source : IMF Staff Country Report No.00/36

Thanks to tight fiscal policies and a positive balance of trade, the government budget deficit decreased to 2.4% of GDP in 1997 compared to 6% in 1994 and 11% in 1993.

Table 2.1-5 shows the government budget deficit in 1993 to 1997.

Table 2.1-5 General Government Finances (Percent of GDP)

Year	1994	1995	1996	1997	1998
Revenue	29.2	34.6	34.3	30.1	32.4
Expenditure	38.3	37.6	36.2	32.5	34.8
Balance	-4.4	-4.1	-7.3	-2.2	-3.4

Source : IMF Staff Country Report No.98/116

Major trade products of Uzbekistan include cotton, gold and energy for export, and food, energy products and machines for import. Table 2.1-6 shows the import and export amount in 1992 to 1997. The export of cotton and gold remains flat, while the export of energy has been gradually increasing. The import of energy products has quickly decreased. Trade with Japan accounts for only 1 to 2% of the total trade amount, though it has been increasing gradually. Import from Japan includes air compressors, textile machines and pumps, while export to Japan includes gold, cotton fiber and raw cotton. Table 2.1-7 shows the import to and export from Japan in the past three years.

Table 2.1-6 Merchandise Trade Balance (In millions of U.S. dollars)

Year	Export from Japan	Import to Japan	Income and expenditure
1997	56	36	20
1998	67	41	26
1999	84	33	51

Source : IMF Staff Country Report No.98/116

Table 2.1-7 Trade Balance between Japan (In millions of U.S. dollars)

Year	1994	1995	1996	1997	1998	1999
Export	2,940	3,475	3,534	3,695	2,888	1,843
Cotton fiber	1,508	1,584	1,539	1,390	1,198	462
Gold	375	611	906	738	277	192
Energy	-	436	277	528	655	538
Others	1,057	844	813	1,039	758	651
Import	2,726	3,238	4,240	3,768	2,717	1,855
Food	861	618	1,252	786	446	279
Energy Products	674	53	45	23	16	14
Machine products	-	1,151	1,542	1,868	1,352	910
Others	1,190	1,415	1,402	1,091	903	653
Income and expenditure	214	237	-706	-72	171	-12

Source : IMF Staff Country Report No.00/36

In 1995, the Government of Uzbekistan announced its intention to launch a privatization program. It would provide for the transformation of 3,000 state enterprises into corporate entities with 51% controlling interests sold to the public and 30% interests sold to private investment funds. Certain strategic sectors such as energy, fuel and gold mining would be temporarily exempted from the program with the government retaining controlling interests. Among the enterprises selected to participate in the program are a mine that produces most of Uzbekistan's copper, gold production facilities, iron and steel plants, and an aviation

company. Currently, 83% of all enterprises belong to the non-state form of ownership, which produce 70% of the nation's GDP.

The Government of Uzbekistan greatly welcomes foreign investment, and is clearly committed to making the investment climate in the country the safest in the NIS. A specially designed and recently updated legislation lays down the fundamental basis for foreign investment activities, ensuring the protection of rights and interests of all foreign investors. A number of clearly determined priority investment sectors can receive numerous privileges for foreign investors that range from certain tax exemptions to extra guarantees. Annual foreign investments in Uzbekistan grew from USD85 million in 1994 to USD264 million in 1997. With respect to the number of ventures, Turkey and the U.S. are the largest investors, while South Korea, Indonesia, the U.K., Germany and Japan are also major contributors in terms of investment volume.

### 2.3.2 Agriculture

During the era of the ex-Soviet Union, the major role of the Soviet Republic of Uzbekistan was to produce energy, gold and other mineral resources, cotton, vegetables and fruits intended for export to other nations in the Soviet Union. At present, agriculture accounts for about 30% of the GDP, and is still one of the sectors that greatly contribute to the development of the economy of Uzbekistan. Also, indirect contributions by agriculture include the increase in the demand of fertilizers, agricultural machines and their transportation service, which means that non-agricultural sectors' contribution to the GDP have increased thanks to the large agricultural production. About 60% of the population are residing in rural areas, and making a living by farming. Agricultural employment is about 3.5 million people, about 40% of the nation's total employment.

During a time of disorder before and after independence, the agricultural production did not decline so much, which greatly contributed to a relatively modest progress of economic reforms. In 1996, the agricultural sector experienced a 7% decline in production, though it recovered in the next year due to good weathers. Despite a government's policy for increasing the production of wheat toward a better food security, cotton remains the most important crop without losing its status as called "white gold." Uzbekistan is one of the largest producers and exporters of fruits and vegetables in the NIS, producing per year about 0.55 million tons of fruits such as apricots, strawberries, melons, watermelons and apples, 0.5 million tons of grapes, 2.3 million tons of vegetables such as tomatoes, lettuce and peas, and 0.69 million tons of potatoes. Table 2.1-8 shows the production of major agricultural products.

Table 2.1-8 Production of Selected Agricultural Products (In 1000 tons)

Year	1995	1996	1997	1998	1999
Raw cotton	3,934	3,350	3,641	3,206	3,750
Grains	3,215	3,549	3,788	4,148	4,813
Wheat	2,347	2,737	3,073	3,556	3,740
Rice	328	445	394	373	535
Potatoes	440	490	686	692	672
Vegetables	2,713	2,481	2,348	2,403	2,485
Fruits	602	585	546	543	510
Grapes	621	474	505	336	376
Livestock and poultry	853	854	801	809	825
Milk	3,665	3,390	3,406	3,495	3,595
Eggs (millions)	1,232	1,057	1,075	1,165	1,304
Wool	20	15	15	15	16
Karakul/Sheepskin (thousands)	1,393	1,370	1,411	803	724
Silk Cocoons	24	22	21	20	19
Tobacco	17	12	31	34	34

Source : IMF Staff Country Report No.98/116

A Government policy for enhancing the self-sufficiency of foods gave an adverse effect on the national benefits for a short time, but in turn effected the expected results: deregulated livestock farming and a better productivity in the planting and cropping of fruits, vegetables and tobacco. Crops under the free market mechanism, especially cotton, was also affected in a favorable way by this political change with respect to the national food security. Agricultural producers now can select crops of better profitability according to the current exchange rates, and can be given incentives to improve the productivity, which may lead eventually to the protection of soil and environment. Deregulation and privatization of agriculture would give solutions to the government's budgetary problems, and contribute to the stable, sound development of the macroeconomics of Uzbekistan. The Government officially says that agricultural reforms are keys to the successful development of the national economy. However, private land ownership is prohibited. Instead, the Government is in the process of reconstructing cooperatives and stock companies. Cotton, being considered a strategic product, is prohibited to be produced in private lands.

Annual investments for agriculture through the past three years are around 7% of the total investments that is smaller than 38% for the mining industry where energy-related investments are becoming larger. This indicates that agricultural machines parts have been left unrepaired, privatization has not been effected well, and agricultural infrastructure has not been developed well. Most part of the investments for agriculture are national budgets with a limited amount of foreign capitals. And the budgets are used mainly through rental

agricultural machine companies. Table 2.1-9 shows investment amounts in each sector.

Table 2.1-9 The amount of investment by industry (%)

Year	1995	1996	1997	1998
Agriculture	7	7	6	6
Industry	49	34	31	31
Energy relation	(11)	(18)	(16)	(16)
Other Sectors	44	59	63	63
Total	100	100	100	100

Source : IMF Staff Country Report No.00/36

(1) Cotton

The total area of irrigated land for cotton plantation increased from 2.3 million hectare to 4 million hectare within the two decades from the 1960's to 80's. Before independence, most of the cotton harvest had been exported to other nations in the Soviet Union. However, after independence, the major importers of Uzbekistan's cotton are western countries. Uzbekistan is the world's fifth largest producer of cotton (6% share in the world), and the world's second largest exporter (17% share in the world).

The export sales of cotton in 1995 climbed up to USD1.6 billion partly due to the rise of market price, followed by a decline to USD1.4 billion in 1997 due to the smaller production and lowered market price. Decrease in land under cultivation for cotton plantation to 1.5 million hectare and lower productivity were also the cause of the reduction in production and export. Uzbekistan's cotton productivity (750 kg/hectare in terms of cotton fiber) is higher than that of the neighboring countries, but slightly lower than that of China and other producing countries under the similar planting conditions. To raise the productivity, the Government of Uzbekistan has decided to support the cotton producing sector e.g. by funding the introduction of new technologies (use of vinyl sheets). In 1997, the export of cotton declined to less than 40% of the total export, though it remains the largest source of foreign currencies among the major export items. Collection (from the producers) and processing of cotton is a business under the monopoly of Government-owned companies. Table 2.1-10 shows the production and export of cotton of major producing countries.

(2) Wheat and other crops

After independence, the production of wheat quickly increased due to the increase in the area of land under cultivation. In 1997, the wheat production was over 3 million tons, about 80% of the total yield of all crops. In 1996, the export of wheat increased significantly due to the rise of market price, so that the Government was forced to import wheat for domestic demand.

Recently, potato production has quickly increased due to the increase in the area of land under cultivation. By contrast, the production of vegetables has declined due to the conversion of crops to potato at collective farms.



Table 2.1-10 Cotton World Production and Export quantity (In 1,000 tons)

Year	1992/1993	1993/1994	1994/1995	1995/1996	1996/1997
World production	17,961	16,707	18,636	20,254	19,417
United States	3,531	3,513	4,281	3,897	4,124
China	4,507	3,745	4,333	4,768	4,202
India	2,346	2,066	2,354	2,885	3,000
Pakistan	1,540	1,368	1,361	1,785	1,589
Uzbekistan	1,274	1,321	1,258	1,250	1,034
Turkey	574	602	628	852	784
World exports	5575	5,815	6,176	6,065	5,768
United States	1,132	1,494	2,047	1,671	1,495
Uzbekistan	1,197	1,263	1,090	985	991
Franc-Zone Africa	446	441	584	609	735
Australia	369	366	293	319	533
India	234	66	18	145	277
Pakistan	256	69	32	312	26
Argentina	65	69	197	266	290
Uzbekistan/world production (%)	7	8	7	6	5
Uzbekistan/world exports (%)	21	22	18	16	17

Source : IMF Staff Country Report No.98/116

### (3) Livestock

Livestock businesses recently experienced a sharp decline of the number of animals except cattle due to the reduction in the supply of feed grains as a result of farm land conversion for cropping with wheat. Nowadays, most of livestock products are sold in free markets, which has resulted in the shortage of raw materials to be supplied to Government-owned milk and meat processing plants, as is the case with fruits and vegetables.

#### 2.3.3 Mining and Metallurgy

Uzbekistan's nonferrous metals, particularly gold, make a strong contribution to its export earnings. Currently producing about 70 tons of gold per year, Uzbekistan is the seventh largest producer in the world, and contains the fourth largest reserves. One of the major foreign investments - Newmont Mining Corporation (the USA) - is in this sector, and is being carried out in joint venture with the State Committee on Geology and the Navoi Mining Company. Newmont Mining is carrying out a USD150 million investment to process the tailings from the Muruntau open pit, the largest such open mine in the world. Newmont has also formed a joint venture with Mitsui (Japan) and the State Committee on Geology to develop the Angren mine, south of Tashkent.

Other minerals which play an important role in Uzbekistan's economy include uranium, copper, zinc, tungsten, molybdenum and lead. Currently the world's fourth largest uranium producer, Uzbekistan exported nearly USD11 million in uranium concentrate to the USA in 1996. Copper production is also highly developed; Uzbekistan was the third largest producer of copper in the former Soviet Union. The Almalyk Mining and Metallurgical Works, near Tashkent, processes most of Uzbekistan's copper and zinc, currently generating about USD300 million in copper and USD10 million in zinc export per year. The Government of Uzbekistan wishes to increase the efficiency of mining and extraction of its mining resources. To encourage the introduction of up-to-date technologies, Uzbekistan is seeking close cooperation with companies possessing the appropriate scientific and technological expertise.

#### 2.3.4 Manufacturing

Manufacturing in Uzbekistan is mostly in the textile, automotive and aerospace industries. The Uzbek Association for Production of Light Industry Goods (Uzbeklegprom) produces about 90% of Uzbekistan's textiles with an annual fabric output declining from 700 million meters in 1993 to a current level of about 650 million meters. Uzbeklegprom hopes to restore its production capacity with the help of a number of Turkish, South Korean, German, U.S. and Italian venture partners. The cornerstone of Uzbekistan's automotive industry is the Uzbek Association of Automobile Enterprises (Uzavtosanoat), which has been most successful in developing joint ventures with South Korea's Daewoo company. The USD658 million Daewoo-Uzavtosanoat plant located in Andizhan began production in 1996 with the goal of reaching turnout levels of 200,000 units by the year 2000. Starting with 16% local parts, the plant hopes to enhance local sourcing to more than 72% by the turn of the century.

Uzbekistan's Chkalov Corporation has great potential in the aircraft production industry. This enterprise maintains one of the largest and most significant aircraft assembly plants in Central Asia, producing the IL-76 cargo aircraft. In September 1996, the Chkalov plant also began producing the IL-114T cargo aircraft and the IL-114 passenger version.

Developing its engineering potential, Uzbekistan now also produces motors, cable and wire products, excavators, cranes, elevators, textile and spinning equipment, and cotton gins. The country specializes in agricultural machinery, producing cotton harvesters and tractors for the former Soviet Union.

### 2.3.5 Telecommunications

With only 1.5 million telephones and analogue exchange equipment up to 40 years old, Uzbekistan lags behind telecommunications systems common in developed countries. However, considerable progress has been made through the creation of cellular communications networks and the installation of digital lines and exchange systems. The U.S.-Uzbek joint venture "Uzdunrobita" has established cellular service using equipment provided by Motorola (USA) and Northern Telecom (Canada).

Besides Uzdunrobita, five more companies have been launched over the past two years, that also provide cellular telecommunication service. German, South Korean, U.S. and Japanese companies are active for supporting the development of digital telecommunication systems in Uzbekistan, using soft loans totaling USD120 million, mostly from the Japan Bank for International Cooperation.

## 2.4 Energy Situations

### 2.4.1 Overview

Uzbekistan is rich in energy resources, though the country had not been a real exporter of energy until 1997 due to the import of energy products that was larger than the export. Tables 2.1-11 and 2.1-12 show the import and export of Uzbekistan's major energy resources of oil, oil products, natural gas, coal and electric power.

Table 2.1-11 Crude Oil and Oil Products Energy Balance (In 1000 tons)

Year	1994	1995	1996	1997	1998
Domestic crude oil extraction	5,516.7	7,586.2	7,621.4	7,891.0	8,104.0
Oil and oil product imports	3,186.7	167.0	4.5	4.0	-
Crude oil	3,052.7	150.5	4.5	4.0	-
Gasoline	95.9	7.5	-	-	-
Diesel oil	38.1	9.0	-	-	-
Heavy oil	-	-	-	-	-
Oil and oil product exports	535.2	339.5	451.9	1,190.0	948.0
Crude oil	271.4	160.9	288.6	912.0	573.0
Gasoline	5.6	25.1	39.0	29.0	113.0
Diesel fuel	13.2	12.8	61.2	245.0	219.0
Heavy oil	245.0	140.7	63.1	4.0	43.0
Refinery loss	208.0	182.0	182.0	181.3	222.0
Domestic consumption of oil products	7,960.2	7,231.7	6,992.0	6,523.7	6,934.0

Source : IMF Staff Country Report No.00/36

Table 2.1-12 Non-Oil Energy Balances

Year	1994	1995	1996	1997	1998
Natural gas (million m <sup>3</sup> )					
Domestic extraction	47,181	48,558	48,977	51,245	54,790
Export	4,637	4,199	4,911	9,897	5,228
Import	1,836	-	-	2,760	1,062
Stockbuilding and losses	3,961	4,257	4,786	158	3,276
Domestic consumption	40,419	40,102	39,280	44,266	47,348
Coal (1000t)					
Domestic extraction	3,845	3,054	2,837	2,947	2,953
Export	81	81	78	30	30
Import	129	11	12	27	0
Domestic consumption	3,893	2,983	2,771	2,792	2,275
Electric power (GWh)					
Domestic production	47,755	47,453	45,420	46,056	45,935
Export	2,800	2,514	1,068	11,488	10,642
Import	1,440	1,222	2,160	12,417	10,919
Domestic consumption	46,395	46,161	46,512	46,985	46,111

Source : IMF Staff Country Report No.00/36

Uzbekistan rests astride the major oil and gas fields of Central Asia. It has confirmed reserves of 2 trillion cubic meters of gas and 350 million tons of oil. It accounts for 14% of the potential hydroelectric resources in Central Asia. It possesses substantial hydrocarbon resources, particularly in natural gas, being the world's eighth largest producer of natural gas. Oil and gas productions are managed by Uzbekneftegas, Uzbekistan's state-owned national oil and gas corporation.

Table 2.1-13 shows the domestic market prices of energies.

Table 2.1-13 Selected Energy Prices (In sum per unit)

	Unit	1995/4/1	1996/4/1	1997/4/1	1998/4/1
Electricity Wholesale	k Wh	0.27	1.66	1.66	1.66
Retail	k Wh	0.10	1.25	1.60	2.00
Coal Wholesale	ton	413	1,385	1,600	1,600
Crude Oil Wholesale	ton	260	3,700	5,100	5,100
Natural Gas Wholesale	1000m <sup>3</sup>	125	2,220	2,600	2,600
Retail	1000m <sup>3</sup>	15	225	450	1,350
Petroleum products					
Gasoline Wholesale	ton	10,400	19,500	23,400	32,500
Diesel oil	ton	7,006	15,985	16,563	16,563
Heavy oil	ton	1,079	2,960	3,100	3,100
Gasoline Retail	liter	8	15	18	25

#### 2.4.2 Oil

Uzbekistan has attained the distinction of being the only former Soviet state to enhance oil production since independence. During 1992 to 1996, Uzbekistan increased oil production threefold (66,000 barrels/day in 1992, 183,000 barrels/day in 1996). As a result, the country has reached crude-oil self sufficiency (however, the domestic oil is sulfur-rich so that refined products continue to depend on imported oil).

Uzbekneftegas projects that by 2000, oil output will reach 10 million tons, and 12 million tons by 2010. The Ferghana and Alty-Aryk oil refineries have a total capacity of 8.6 million tons a year. They produce a wide range of oil products, including transformer lubricants and a variety of industrial anti-freeze lubricants. The oil refinery in Bukhara was constructed by a French company Technip and Japanese companies Marubeni & JGC. Since 1997, the refinery has been processing condensates from the Kokdumalak field. The capacity of the refinery is 5 million tons of oil and condensates. The first phase of construction, completed in 1997, enabled the refinery to produce annually 210 thousand tons of 76-octane gasoline, 450 thousand tons of 93-octane gasoline, 1.3 million tons of diesel oil, 300 thousand tons of aviation gasoline and 12 thousand tons of sulfur.

Uzbekistan has a long-term plan to enhance oil and natural gas exports, and is active for accepting foreign capitals for developing natural resources and increasing production.

November 1996, Uzbekistan has concluded an agreement with Unocal (USA) on field surveys regarding oil and natural gas reserves in Uzbekistan, and on the use of existing oil pipelines for the Unocal's Central Asia Oil Pipeline (CAOP) construction project. The CAOP project will connect oil producing countries in Central Asia to the coast of the Arabian Sea in Pakistan. The project would stimulate foreign investors to participate in Uzbekistan's domestic projects, and result in the increase in oil production in Uzbekistan.

Uzbekistan, like the Caspian Sea coastal countries without facing on open seas, has a problem of "isolated from the market." To remove this problem and export oil, Uzbekistan must have oil pipelines leading to coasts of open waters. Besides the project mentioned above, Uzbekistan has joined an oil pipeline construction project (about 1,800 miles) to connect between the country and China.

#### 2.4.3 Natural Gas

Uzbekistan is the only former Soviet state that has increased natural gas production since independence. Presently the state is the world's eighth largest producer. Natural gas fields

already developed are located mainly in the southwest of the state where there are old fields such as Shurtan and Kokdumalak. A Government's short-term plan has a goal of increasing production through enhancing the existing facilities, while a long-term plan has a goal of developing new fields using foreign assistance.

Uzbekistan is active for promoting the use of domestic natural gas toward self-sufficiency. To achieve this, the Government has encouraged the use of natural gas as the fuel of automobiles and chemical plants in Shurtan.

Meanwhile, the increase in domestic consumption of natural gas has resulted in the decline of export. Poor gas pipelines connecting among Uzbekistan, Russia and other former Soviet countries and some importers' (Kazakhstan, etc.) failure to pay are also the cause of the reduction of export.

To develop other export routes, Uzbekistan is planning to develop new gas pipelines, including the enhancement of the Central Asia-Central Russia pipeline. This enhancement would enable export from Central Asian countries to European markets. Other new pipeline construction possibilities include an already concluded agreement with Turkmenistan, Afghanistan and Pakistan to construct a pipeline connecting to Pakistan, and a route (about 3,800 miles) to China from Turkmenistan, Uzbekistan and Afghanistan.

#### 2.4.4 Coal

Uzbekistan's coal reserves are situated mainly in Angren, Baisun and Shargun. In 1997, the Angren coal reserves produced 2.9 million tons (mostly lignite), over 80% of the total production throughout the country. The recent efforts to modernize mining facilities have led to the significant increase in production at Angren coal mines.

At Shargun coal mines, the production of high-quality coal is expected to increase two to threefold thanks to investments for facility modernization.

**CHAPTER 3 PRESENT STATUS OF  
ELECTRIC POWER AND  
HEAT ENERGY SECTOR  
IN UZBEKISTAN**

**THE DETAILED DESIGN STUDY FOR  
MODERNIZATION OF TASHKENT THERMAL POWER PLANT  
IN THE REPUBLIC OF UZBEKISTAN**

**FINAL REPORT**

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