

**The World Bank**

**Uzbekistan**

**Energy Sector: Issues, Analysis, and an Agenda for Reform**

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## List of Abbreviations

|        |   |
|--------|---|
| ADB    | Asian Development Bank                            |
| BCM    | Billion Cubic Meters (1,000,000,000 Cubic Meters) |
| BNPP   | Banque Nationale de Paris Paribas                 |
| CAPS   | Central Asia Power System                         |
| CA UDC | Central Asia United Dispatch Center               |
| CCPB   | Case-by-Case Privatization Bureau                 |
| CIS    | Commonwealth of Independent States                |
| CNG    | Compressed Natural Gas                            |
| COM    | Cabinet of Ministers                              |
| E&P    | Exploration and Production                        |
| ESW    | Economic and Sector Work                          |
| FDI    | Foreign Direct Investments                        |
| FEC    | Fuel Energy Complex                               |
| GDP    | Gross Domestic Product                            |
| GKI    | GosKomImushzestvo (State Property Committee)      |
| GWh    | Gigawatt hour (1,000,000 kilowatt hours)          |
| KCM    | Kilo Cubic Meters (1,000 Cubic Meters)            |
| kV     | kilovolt (1,000 volts)                            |
| kWh    | kilowatt hour                                     |
| LPG    | Liquefied Petroleum Gas                           |
| LRMC   | Long Run Marginal Cost                            |
| MCM    | Million Cubic Meters (1,000,000 Cubic Meters)     |
| MTOE   | Million Tons of Oil Equivalent                    |
| MW     | Megawatt  |
| NHC    | National Holding Company                          |
| PSA    | Production Sharing Agreement                      |
| QFA    | Quasi Fiscal Activities                           |
| QFD    | Quasi Fiscal Deficit                              |
| R/P    | Reserves-to-Production                            |
| SME    | Small and Medium Enterprises                      |
| SOE    | State Owned Enterprise                            |
| TOE    | Tons of Oil Equivalent                            |
| TPS    | Thermal Power Station                             |
| UE     | UzbekEnergO                                       |
| UGEN   | UzGosEnergONadzor                                 |
| UNG    | UzbekNefteGas                                     |
| UNGI   | UzNefteGasInspectsia                              |

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## **Uzbekistan**

### **Energy Sector: Issues, Analysis and an Agenda for Reform**

#### **Executive Summary**

Uzbekistan is endowed with considerable primary energy resources, particularly fossil fuel resources, which have enabled the use of the energy sector to (a) implicitly subsidize other sectors of the economy by maintaining prices of petroleum products, natural gas, and electricity at very low levels; (b) support living standards by expanding the access of the population to natural gas with the goal of 100 percent coverage; and (c) achieve energy self-sufficiency, as a tool to lessen economic (and concomitant political) dependence on Russia.

However, Uzbekistan pays a high price for its energy policy. Uzbekistan borrowed heavily to finance the development of the oil and gas sector. Since independence, the energy sector has received roughly \$1.8 billion in foreign loans under government guarantees. The ability of the energy sector to repay these loans is questionable given the sector's current inadequate cost recovery. Oil and coal are sold at a fraction of world market prices (at an indicative exchange rate, the domestic wholesale crude oil price is one-quarter its export parity price, and the retail coal price is less than 20 percent its export parity). Electricity prices charged to all sectors remain a fraction of long run marginal cost (an average weighted tariff posted on June 1, 2003 of 1.26 UScents/kWh against about 3.5 UScents/kWh) as do gas prices (the retail gas price is one-third of its long run marginal cost). In early 2002, the authorities adopted a medium-term energy price program reportedly envisioning quarterly energy price increases totaling around 50 percent per annum in nominal terms. As part of the program, electricity tariffs were raised by over 70 percent between April 2002 and June 2003. However, energy price increases at this pace barely keep up with inflation and are unlikely to substantially improve financial situation of the sector. In addition, energy non-payment is widespread. The authorities declined to provide non-payment data but interviews with enterprises indicate that in some energy sub-sectors non-payments exceed 50 percent of total billings, and that barter offsetting schemes are common. As a result of low cost recovery and reinvestment, the capital stock in parts of the energy sector has been run down and is in urgent need of rehabilitation or replacement. According to a recent study, required investment in thermal power plants alone could exceed \$1 billion in the next 3 to 5 years. Most importantly, the cheap energy prices buttress the massive energy inefficiency. The energy intensity of the Uzbek economy remains very high (2.2 TOE/1000US\$ in 1999), over three times as high as in countries like China or Vietnam, and far above the levels of Kazakhstan or Russia.

Energy inefficiencies are prevalent in the whole economy. Gas transmission and distribution losses are estimated at about 27 percent in 2002, at least 22-25 percentage points above industry standard. Technical and commercial losses reported by UzbekEnergo amount to 18 percent of electricity generated, almost twice the 10 percent level routinely achieved elsewhere. In addition to the very low prices and problems with non-payment of bills, inadequate metering of energy consumption further reduces the incentives to use energy efficiently. In the gas sector, only 6 percent of the 3.5 million households who have been given

access to the gas network had meters at the beginning of 2002. Recognizing the seriousness of the problem, the government has decreed an ambitious program for metering all household gas consumers within the next 3 years. In the electricity sector, it is likely that many meters need replacement due to age and increased loads.

In sum, the rich fuel endowment is currently used to provide highly subsidized energy to the entire economy – industry, agriculture, transportation, and households, benefiting rich and poor alike. Unfortunately, this current form of handing over the benefits of the resource endowment to the population is inefficient and unsustainable; inefficient because valuable energy is wasted on a massive scale and unsustainable because of the mounting levels of quasi fiscal deficits and quasi fiscal activities in the energy sector, estimated at \$2.2 billion in 2002. The known resources of oil and gas will be exhausted rapidly if the wasteful use of energy continues and new exploration and development of reserves is not undertaken due to lack of funds. At current production levels, the officially reported gas reserves provide a reserves-to-production (R/P) ratio of about 33 years (i.e., existing proven reserves will last for 33 years). While this is a relatively high ratio, it has declined from an estimated 42 years in 1997. Similarly, the oil R/P ratio has declined from 13 to 11 years over the same period. Modifying the current energy policy to make it more efficient and sustainable while protecting the poor from adverse effects of energy price increases is one of the major policy challenges for the country.

### **Energy Reform Strategy**

The Government faces some critical challenges in realizing the oil and gas export potential and in meeting its electricity demand in a sustainable way. The country's oil and gas reserves need to be replaced with identification of additional reserves, the deterioration in energy infrastructure should be arrested and energy should be used more efficiently. To achieve these objectives requires large investments - a sizeable part of which should come from foreign investors - as well as modern technology and know-how.

The Government has indeed chosen the option of attracting private investments by means of a sale of portions – mainly minority stakes – of SOEs responsible for oil and gas production, transportation and refining, and electricity sector, to strategic foreign investors. In this regard, international experience over the last ten years, in transition economies as well as other developing countries, points to a few key lessons that should be considered. First, appropriate pricing of energy commodities and products is fundamental. Second, a strong demonstrated commitment to enforce financial discipline is necessary. Third, investors require majority stakes in strategic sales, but also are willing to consider other options for private sector participation. Fourth, for segments of the industry that have a monopolistic nature (e.g., transmission of gas and electricity) and a utility service function (e.g., gas and electricity distribution), an appropriate legal and regulatory framework should be in place. Fifth, completing the reform of the energy sector is a time consuming process, and could take up to ten years. Lastly, while the entire reform process would take a long time, critical actions should be initiated immediately. The following paragraphs discuss how Uzbek authorities can draw upon these lessons to devise their strategy aimed at developing the country's energy sector with the help of private investments.

As regards pricing, given the significant distortions in the current energy pricing regime, the pricing adjustments would need to start without delay but be implemented in phases, and over the medium term. The *first phase* could involve liberalizing petroleum and coal prices, and *initiating* a program of gradual real increases in gas and electricity prices. *Liberalizing petroleum and coal prices* quickly, recognizing the opportunity value associated with export markets for oil and coal, would yield significant gains at low costs, since they are more readily exportable than gas, and their price increase would induce efficient domestic consumption and not affect the poor as much since they are consumed less by the poor both directly and indirectly. Price increases for electricity, gas, and heat may be modest in the first phase, although real increases should continue, since time is needed to introduce a reliable social protection mechanism for the poor. Finally, an important element of the first stage should be the development, publication and implementation of a *medium term tariff policy* for all utility services, including gas and electricity.

With regard to commitment to enforce financial discipline, steps to reduce commercial losses should be undertaken urgently by addressing key issues such as non-payment of bills, inadequate metering, and utility privileges. Particular emphasis should be placed on the *improvement in payment performance by state owned enterprises and eliminating legal restrictions to cutting off energy supply to non-paying enterprises*. Reducing future non-payment by state enterprises would also harden budget constraints and induce enterprises to restructure and become more competitive. The Government has also recognized the importance of reducing commercial losses and has started an ambitious program of gas *metering*. Such program of metering (or re-metering with accurate and tamper-proof devices) should be carried out in the electricity and heat sectors as well.

The *second phase* of the energy reform, could then focus on more aggressive gas and electricity tariff increases, by which time metering should be more widespread; a tested, functioning social protection mechanism for energy would be in place; and also efficiency of service delivery would have improved due to better metering, billing and collection that would buttress the larger price increases. It is useful to note that the above two actions, on pricing and reduction of commercial losses, are pre-requisites for eliciting private sector interest, and will go a long way in reducing the huge quasi-fiscal deficit.

Regarding private sector participation, it is important that the Government recognizes the difficult internal environment (see the discussion on Enterprises and Private Sector Development) as well as the dwindling interests of western investors in developing country energy assets globally, and therefore be realistic in its expectations about private investments. The Government should offer majority stakes in strategic sales to investors. In addition, the Government should consider alternative approaches to private sector participation, such as: (a) concessions, where the assets are turned over to a private concessionaire, who will have responsibility for investments; (b) joint ventures with the state where the private investor has the majority and management control; (c) franchise models, where a foreign operator/manager takes over the operation of an asset with a small equity stake; and (d) performance-oriented management contracts.

Efforts to attract private sector in energy should also follow a phased approach. In the first phase, they could be focused on (a) upstream oil and the oil services sector, because investor

interest is highest in development of existing oil reserves and further exploration; and (b) refined product and LPG distribution and marketing, since this segment of the sector is easiest to privatize including to local SMEs. Private sector participation in refineries, parts of the upstream gas sector, gas distribution, and electricity distribution and generation should all be part of a *second phase*, since private sector participation in such assets and businesses requires significantly more preparation in terms of legal, regulatory, and organizational changes.

Preparation of the more complex segments, such as electricity and gas transmission distribution, for private sector participation requires establishing an appropriate industry structure for both gas and electricity, as well as an acceptable legal and regulatory regime. Work is already underway for the oil and gas sector (except gas distribution) and is being planned for the electricity sector. As regards legal framework, the Government should enact key legislation in the energy sector together with supporting regulations. This should include a Petroleum Law during the first phase and an Electricity Law during the second phase. In addition, a single strong and independent regulatory body for the entire energy sector should be established. In the first phase, the two existing technical regulatory bodies (one each for oil and gas and for electricity) should be merged, given authority to regulate prices (which is currently with the Ministry of Finance) and work initiated to build regulatory capacity to strengthen this body and provide the legal basis to make it independent. The implementation of the strengthening and independence measures would happen during the second phase.

Finally, the Government should realize that reform of the energy sector is a time consuming process. The first phase, which would take up to two years, would comprise critical actions such as complete liberalization of petroleum and coal prices, initiation of modest but real tariff increases for gas and electricity, implementing social protection mechanism(s) for the poor, implementing measures to enhance financial discipline, privatization of upstream oil, oil services, and retail operations of petroleum and LPG, initiation of the industry structure for oil and gas, passage of a petroleum law, and initiation of the creation of an independent regulatory body. The second phase would require another 3 years, and would comprise more aggressive tariff adjustments for gas and electricity, completion of the revision of the industry structure, passage of an electricity law, and private sector participation in the remaining parts of the oil and gas sector, and implementation of the regulatory framework. This phase would also include initiation of private sector participation in the electricity and gas distribution sectors.

Experience elsewhere shows that, as soon as there is demonstrated commitment to address the pricing issues and financial discipline issues, i.e., say at the end of the first phase, private investors would start showing interest in the sector. Therefore, the government should be in a position to realize some private investments during the second phase, if necessary using contract based regulations (such as concessions) while the regulatory capacity is still being developed. However, the bulk of the private investments would come in a third phase, assuming of course the reform momentum is sustained during the first five years (i.e. the first and second phase). During this third phase, fine-tuning of the regulatory framework and legal framework, as necessary would also be implemented.

# UZBEKISTAN

## Energy Sector: Issues, Analysis and an Agenda for Reform

### Chapter I: Background and Institutional Setup

#### Background

1. Uzbekistan is endowed with considerable primary energy resources, particularly fossil fuel resources. As shown in Table 1, the fossil fuel primary energy resources amount to about 4.4 billion tons of oil equivalent (TOE). Additionally, the country has hydroelectricity potential about 1620 MW.

**Table 1: Primary Energy Resources**

| <b>Fossil Fuel Reserves</b> |              |
|-----------------------------|--------------|
| Crude Oil (million TOE)     | 82           |
| Gas (million TOE)           | 1,476        |
| Coal (million TOE)          | 2,851        |
| Total (million TOE)         | 4,409        |
| <b>Hydro Potential (MW)</b> | <b>1,620</b> |

2. Hydrocarbon reserves are from 171 discovered oil and gas fields in the country. Among these, **crude oil** is produced at 51 fields, gas at 27 fields, and condensate at 17 fields. The Bukhara-Khiva region contains over 60% of Uzbekistan's known oil fields, including the Kokdumalak field, which accounts for about 70% of the country's oil production. In addition, the Fergana region contains another 20% of the country's oilfields, and the Ustyurt plateau and the Aral Sea have been targeted for further exploration.

3. The country's **gas reserves** are estimated at 1,875 BCM, with the richest gas district in the Uzbek section of the Ustyurt Region. 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 35%, from 42.8 BCM in 1992 to 57.7 BCM in 2002. Most gas production is concentrated in 12 deposits, particularly in fields such as Shurtan and Kokdumalak.

4. Uzbekistan has estimated **coal reserves** of 3.99 billion tons, primarily in the Angren, Baisun, and Shargun deposits. Uzbek coal production in 2002 amounted at 2.6 million tons, about 40% decline from 1992. Almost all coal was consumed in Uzbekistan except for some 6 thousand tons that was exported to Afghanistan. The Angren open-cast mine alone, which is the

country's largest coal deposit, with about 1.8 billion tons of mostly brown coal, supplies about 80% of the country's total coal production.

5. **Refining Capacities.** Uzbekistan has two older refineries at Fergana and Alty-Arik, and a new one at Bukhara, with a total refining capacity of 11.1 million tons/year. The Bukhara refinery, which was the first refinery built in the CIS since the breakup of the Soviet Union and cost in excess of \$400 million, currently has a capacity of 2.5 million tons/year, although it is expected to expand to 5.0 million tons/year and refine both crude oil and gas condensate. The drop in Uzbekistan's oil production in 2000 resulted in Uzbek refineries operating at less than capacity. In 2002, Uzbekistan's oil refineries refined 6.1 million tons of crude oil and gas condensate. Over the course of 2002, Uzbek refineries produced approximately 1.7 million tons of diesel fuel, 1.6 million tons of gasoline, 1.6 million tons of fuel oil, 0.4 million tons of kerosene, and 0.3 million tons oil bitumen among other products.

6. **Gas Processing.** Much of Uzbekistan's natural gas requires processing due to its high sulfur content. The majority of Uzbekistan's gas is processed at the Mubarek processing plant, which has a capacity of over 28.3 BCM/year. The recently commissioned Shurtan Gas-Chemical Complex, completed at a cost of about US\$1 billion, includes installations to clean gas, a natural gas booster compressor station, and a plant with the capacity to produce 125,000 tons of polyethylene and 137,000 tons of liquefied natural gas per year. There is also the Kodzhaabad underground gas storage facility in Andizhan Region, which was built in 1999 at a cost of \$72 million, allowing increased gas shipments to Uzbekistan's industrial heartland in the Fergana Valley.

7. **Electricity.** Uzbekistan is part of the integrated Central Asia Power System (CAPS). The installed capacity of the country amounts to 11,580 MW which comes from 42 power plants, including 11 thermal power plants with a total capacity of 9,870 MW and 31 hydroelectric power stations with a total capacity of 1,700 MW. The largest natural gas-powered facilities include the Syrdarya (3,000 MW), Tashkent (1,860 MW) and Navoi plants (1,250 MW). The Talimardjan thermal power station (TPS) with its unique 800 MW turbines is currently under construction. The most significant coal-powered facilities are two power plants in the vicinity of the Angren mine near Tashkent, which includes the Novo-Angren (2,100 MW) plant. The largest hydroelectric plant is the Charvak power plant (620 MW).

8. Uzbekistan produces approximately 48,000 GWh of electricity annually. Electricity in Uzbekistan is derived primarily from thermal plants with 77.0% of thermal plants powered by natural gas, 7.0% by fuel oil, 3.5% by coal, and 12.5% from hydro plants.

9. Uzbekistan produced approximately 48,000 GWh of electricity annually and imported around 1,000 GWh electricity from neighboring countries (Tajikistan and Kyrgyz Republic). Uzbekistan also exports small amounts of electricity in the context of technical exchanges within the Central Asia Power System. Uzbekistan is also an importer of electricity from the Kyrgyz Republic in the context of the Inter-Governmental Irrigation Agreements, which have comprehensive arrangements for water and energy exchanges. In the context of these

water/energy exchanges, Uzbekistan has been importing between 800 GWh in wet years and 1,800 GWh in drought years of electricity from the Kyrgyz Republic and Tajikistan

10. Currently the main 110 kV, 220 kV, and 500 kV transmission lines link the power systems of southern Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan. Uzbekistan generates 52 percent of the total power in the CAPS, Tajikistan 16 percent, Kyrgyz Republic 15 percent, Turkmenistan 11 percent, and southern Kazakhstan 6 percent. The Central Asian United Dispatch Center (CA UDC), a State enterprise that equally belongs to all Central Asian states is located in Tashkent, and responsible for maintaining a balanced and synchronized operation of energy transfer and distribution systems of all five Central Asian states.

### **Institutional Setup**

11. Uzbekistan's energy sector is fully state-owned – from oil fields to retail petrol pumps to the electricity system. The policy-making responsibilities are with the Fuel Energy Complex (FEC) headed by a Deputy Prime Minister. Regulatory responsibilities are split between several institutions – the Pricing Department of Ministry of Finance has the responsibility for economic regulation, i.e. price setting of all energy forms, whereas technical regulation is the responsibility of UzGosEnergoNadzor (UGEN) for the electricity sector, and UzNefteGasInspectsia (UNGI) for the hydrocarbon sector. Energy price setting responsibilities in the Ministry of Finance are further split between two units, one dealing with all energy prices to industry as well as with electricity prices to households, and the other with prices of coal and petroleum products applicable to retail consumers. In addition, the State Committee for Nature Protection is responsible for regulating the environmental aspects. Operational responsibilities are those of UzbekNefteGas (UNG) for the hydrocarbon sector, UzbekEnergo (UE) for electricity, and UzbekUgol for Coal. At the moment, UzbekUgol is an independent legal entity in the structure of UzbekEnergo.

12. Despite the existence of the various entities and organizations, energy sector is considered a strategically important sector and all policy decisions, including those relating to industry structure, form and content of sector regulation, pricing, corporate structures of operational entities, privatization and private sector participation - are made at the highest level by the President and the Cabinet of Ministers. Implementation of these decisions is delegated to FEC and the individual agencies such as UNG, UE, etc. Decisions regarding privatization and private sector participation are implemented by GKI (State Property Committee), headed by another deputy Prime Minister.

13. In addition, many decisions of an operational or commercial nature affecting the industry players are administratively regulated and/or subject to approval by the Ministry of Finance, the Anti-Monopoly Committee or the Cabinet of Ministers. For instance, the Special Regulation No. 021 approved by the Ministry of Finance regulates the distribution of cash received by subsidiaries of UzbekNefteGas, and Annex 5 of the COM Decree on Natural Gas Delivery provides a list of consumers who have the right to suspend payments for natural gas for up to 120 days.

## Chapter II: Current Policies and Their Sustainability

14. The Government used the energy sector to implicitly subsidize other sectors of the economy and support living standards. The main policies pursued in the energy sector to achieve the above objectives have been:

- (a) **Achieving energy self-sufficiency, as a tool to lessen economic (and concomitant political) dependence on Russia.** Uzbekistan increased its production of domestic hydrocarbons significantly – crude oil production increased from 2.8 million tons in 1991 to 7.5 million tons in 2000, almost a three-fold increase; production of natural gas increased from 41.9 BCM in 1991 to 55.5 BCM in 2000, a 37% increase. By 1995, Uzbekistan became a net exporter of natural gas. In monetary terms, imports of crude oil, which accounted for US\$485 million in 1995, was reduced to zero by 1996 – 1997.
- (b) **Expanding the access of the population to natural gas with the goal of 100 percent coverage.** Currently, about 3.5 million households, accounting for 95% of the population have access to piped gas, and an additional 720,000 households use LPG. The Government plans are to connect the remaining residential consumers to the gas network within 3 years.
- (c) **Maintaining Low Prices for Energy Products and Commodities to promote domestic industry competitiveness and maintain the living standards of the population.** The prices for petroleum, petroleum products, natural gas, coal and electricity at the beginning of 2003 are given in Table 2.

**Table 2: Prices for Energy Products and Commodities as of June 1 2003**

|                    |                                 | Unit  |         | OER <sup>1)</sup> | Curb<br>ER <sup>2)</sup> | NMER <sup>3)</sup> |
|--------------------|---------------------------------|-------|---------|-------------------|--------------------------|--------------------|
|                    |                                 |       | Soums   | US\$              | US\$                     | US\$               |
| Electricity        | Wholesale                       | kWh   | 13.10   | 0.0135            | 0.0124                   | 0.0130             |
|                    | Retail                          | kWh   | 13.10   | 0.0135            | 0.0124                   | 0.0130             |
| Coal               | Wholesale                       | ton   | 18,300  | 18.84             | 17.26                    | 18.18              |
|                    | Retail                          | ton   | 5,650   | 5.82              | 5.33                     | 5.61               |
| Crude oil          | Wholesale                       | ton   | 21,500  | 22.14             | 20.28                    | 21.36              |
| Natural gas        | Wholesale (power plants)        | KCM   | 17,700  | 18.23             | 16.70                    | 17.58              |
|                    | Retail                          | KCM   | 7,657   | 7.88              | 7.22                     | 7.61               |
|                    | Of which for cooking            | KCM   | 7,657   | 7.88              | 7.22                     | 7.61               |
|                    | for heating                     | KCM   | 3,550   | 3.66              | 3.35                     | 3.53               |
| Petroleum products |                                 |       |         |                   |                          |                    |
|                    | Gasoline (A-72, A-76) Wholesale | ton   | 227,500 | 234.27            | 214.62                   | 225.99             |
|                    | Gasoline (A-92, A-93) Wholesale | ton   | 273,000 | 281.12            | 257.55                   | 271.19             |
|                    | Diesel fuel Wholesale           | ton   | 132,686 | 136.63            | 125.18                   | 131.81             |
|                    | Fuel Oil (Fuel oil) Wholesale   | ton   | 20,400  | 21.01             | 19.25                    | 20.27              |
|                    | Gasoline (A-72, A-76) Retail    | liter | 255     | 0.26              | 0.24                     | 0.25               |
|                    | Gasoline (A-92, A-93) Retail    | liter | 295     | 0.30              | 0.28                     | 0.29               |
|                    | Diesel fuel Retail              | liter | 255     | 0.26              | 0.24                     | 0.25               |

<sup>1)</sup> Official Exchange Rate

<sup>2)</sup> Curb market Exchange Rate

<sup>3)</sup> Nominal Market Exchange Rate calculated as 0.6 x OER + 0.4 x Curb ER

### **Sustainability of the current energy Policies**

15. The current energy policies are unsustainable, and the reasons for this are discussed under: available energy resources vis-à-vis consumptions patterns (reserves of oil/gas; coal; available electricity production capacity compared with consumption trends, energy consumption per capita; energy intensity of the economy); and the foreign borrowing by the energy sector.

16. **Available Energy Resources versus Consumption Patterns.** There is clear evidence that production of hydrocarbons are declining:

- Production of liquid hydrocarbons (crude oil and gas condensate) declined from 8.1 million tons in 1999 to 7.2 million tons in 2002. Such declines may be permanent, because the producing reservoirs are experiencing drop in pressure and water influx. This is certainly true at the Kokdumalek field (in the Mubarek Field area) from which the by far the majority of oil production comes from (3.74 million tons/year).

- Regarding gas condensate, fields such as Shurtan, Zevardy, Pamuk and Kokdumalak, which provide almost 95% of production, have been exploited for so long now that their condensate content is falling as well as the level of gas production. For instance, condensate production declined by 2.5% in 2002, compared to the level in 2001.
- Although there are 27 fields producing gas, more than 95% of production comes from 7 main fields (Shurtan, Zevardy, Alan, Denguizkul-Khaouzak, Kokdumalak, Pamouk and Koultak). Shurtan, Zevardy and Pamouk fields are going into decline. The other 20 fields represent less than 5% of production. New fields not yet on-stream (Kandym, Severnyi, North Nishan, Youzhnaia Tandyrtcha, Adamtash, Goumbulak) are situated in areas where there is no current gas production infrastructure.
- UzbekNefteGaz has not been able to replace the reserves, due to lack of resources, equipment and know how to carry out deep drilling and directional/horizontal drilling. During 2001 the opening of 4 new deposits and the exploration of a further 7 deposits did add 50.2 BCM of free gas (together with 5.1 million tons of recoverable oil and condensate). However, such addition to reserves accounted for only 89% of the annual production of 56 BCM. There are 8 new oil fields being developed but because of low recoverable reserves (150 000 –200 000 tons per field) they are only expected to provide an increase in production of 0.5%.
- There is no reliable independent estimate of the recoverable reserves – the data are not shared with outside consultants and advisors, and as a consequence there is an opinion that the actual recoverable reserves may be just a quarter of what is claimed.
- As regards electricity, almost all of the plant is very old, (average age of more than 30 years) and in need of substantial rehabilitation. According to recent estimates, up to \$1.15 billion investment would be required in the thermal generation plants alone in the next 3 to 5 years. Given that 90% of the production is from thermal sources, maintenance requirements are high. However, due to lack of resources, the level of maintenance being carried out is far from adequate. As a result, the reliability of plant and equipment is very poor. At the same time, the demand is increasing, particularly during peak periods both in summer and winter and the system is unable to meet this peak demand already. According to recent data, there is a peak-period deficit of about 800-900 MW in winter. Further deterioration is very likely, unless resources are mobilized urgently.
- As regards final consumption of gas, the access to gas policy was implemented without any metering, and this is proving to be a significant problem – due to low prices, there is significant over consumption, but there is no way to measure actual consumption. Consequently, losses of 20% or more are reported (compared to a loss level of 2% or so in well-run gas distribution systems).
- The self-sufficiency policy has also resulted in the sector accumulating considerable amounts of debt, mostly in the hydrocarbon sector. As shown in Annex 1, the sectors foreign debts amount to over US\$1.5 billion equivalent, all of it guaranteed by the Government. Of this amount, the hydrocarbon sector accounts for US\$1.4 billion. All of this debt is commercial and/or export credit financing and the debt service would

- peak in the 2002-2005 period. Given the very low level of resource mobilization from within the sector, it is clear that the Government will have to service the debt.
- The energy intensity of the Uzbekistan’s economy, its energy consumption per capita of GDP, is very high, relative to other comparator countries:

**Table 3: Uzbekistan’s 2000 Energy Intensity and those of Comparator Countries**

| Indicators             | Unit         | Uzbekistan | China     | Vietnam |
|------------------------|--------------|------------|-----------|---------|
| Population             | Million      | 24.75      | 1262.46   | 78.52   |
| Gross Domestic Product | US\$ Million | 12,010     | 1,079,961 | 31,168  |
| Energy Intensity       | kgoe/\$1990  | 4.18       | 1.10      | 1.32    |

17. The Government has recognized that the present energy intensity is unsustainable and a program of energy savings has been submitted to the Cabinet of Ministers for consideration. While the details of this draft program remain confidential, it appears that savings of up to 20 to 22 MTOE would be possible in the Uzbek economy, and that the program sets savings of 10 to 11 MTOE as an initial target, given availability of resources for investment in required technology.

18. In summary, the current policies pursued in the energy sector are unsustainable in view of the dwindling resource base, failure to replace hydrocarbon reserves, and very high consumption patterns. The combination of the above policies have also given rise to significant Quasi Fiscal Deficit (QFD), which is discussed below.

### **Quasi Fiscal Deficit**

19. QFD is the implicit subsidy that is provided by the energy sector but ultimately has to be covered by the government. The QFD in the sector essentially consists of four components:

- i. **Non payments for energy supplied.** It is reported that payment levels from households are not a problem. However, many state owned enterprises are significantly in deficit on their payment obligations. For example, to UzTransGas, a branch of UzbekNefteGas responsible for gas transmission and supply to large consumers, UzbekEnergo owes 80 billion soum (or US\$113 million), and BoshKommunGas owes an additional 30 billion soum (US\$42 million). The total arrears of UzTransGas amount to 332 days of sales. In other words almost a whole year sale is tied up in non-payment. As a consequence, UzTransGas owes significant payables to UzNefteGasDobycha, the Exploration/Production subsidiary of UNG.
- ii. **Tariff levels.** In order to ensure the long-term viability of the sector, tariffs need to be set at a level that not only covers ongoing operating costs but also cover future investment needs. The economic value in the electricity and gas sectors, sectors with resource self-sufficiency and little foreign trade, is indicated by the long run marginal

cost (LRMC). In the case of oil (and possibly coal) where there is some exports/imports, export parity pricing better represents the truer value of the commodities. Estimates for LRMC vary from 3.5 to 4.03 US cents/kWh for electricity; and from US\$15 to US\$25/KCM for gas.

- iii. **Operating inefficiencies.** Operating losses in the energy sector are high. For example, technical and unbilled losses<sup>1</sup> reported by UzbekEnergo amount to 23% of electricity generated – well above the level of 10% or less that is routinely achieved elsewhere, while estimated gas transmission and distribution losses of 27% are at least 22-25% percentage points above reasonable expectations.
- iv. **The lost opportunity cost** associated with selling energy in the domestic market at prices that are below international export parity levels. This lost opportunity cost applies particularly to oil and to coal. To compute the lost opportunity cost, for crude oil the comparator price is US\$82/ton, and for Fuel oil and coal export parity prices of US\$25 and US\$24 per ton respectively.

20. Using the above economic values for the energy commodities, the estimate of the quasi fiscal deficit in the energy sector in 2002 is \$1.8 billion and quasi fiscal activities in the energy sector that apply particularly to liquid hydrocarbon (crude oil and gas condensate) are \$0.4 billion, total QFD and QFA is \$2.2 billion, or about 19% of GDP<sup>2</sup>. Table 4 summarizes the components that make up this amount and detailed computations are provided in Annex 2.

**Table 4: Components of the Energy Sector QFD 2002**

| Assumptions:                 | Conservative       | Consultant's estimates    |
|------------------------------|--------------------|---------------------------|
| LRMC for Gas                 | US\$15/KCM         | US\$25/KCM <sup>3</sup>   |
| LRMC for Electricity         | 3.5 USc/kWh        | 4.03 USc/kWh <sup>4</sup> |
| Export parity for Crude Oil  | US\$ 82/ton        | US\$ 82/ton               |
|                              | <b>\$ Millions</b> | <b>\$ Millions</b>        |
| Non Payments:                |                    |                           |
| Gas                          | 143                | 109                       |
| Electricity                  | 74                 | 121                       |
| Sub-Total                    | <u>217</u>         | <u>230</u>                |
| Tariff Shortfall versus LRMC |                    |                           |
| Gas                          | 191                | 548                       |

<sup>1</sup> The difference between electricity delivered to the market and billed consumption.

<sup>2</sup> The estimated amount of 2002 GDP equal to US\$11.7 Billion was used to compute percentage of QFD.

<sup>3</sup> Sofregaz study on 'Institutional, Regulatory, and Pricing Policy Recommendations for the Gas Sector in Uzbekistan'

<sup>4</sup> Fichtner study for the proposed ADB's Regional Transmission project.

|                          |              |              |
|--------------------------|--------------|--------------|
| Electricity              | 1,012        | 1,303        |
| Sub-Total                | <u>1,203</u> | <u>1,851</u> |
| Technical inefficiencies |              |              |
| Gas                      | 193          | 155          |
| Electricity              | 216          | 301          |
|                          | <u>409</u>   | <u>456</u>   |
| Lost Opportunity Cost    |              |              |
| Crude Oil                | 381          | 386          |
| Sub-Total                | <u>381</u>   | <u>386</u>   |
| Total                    | <b>2,210</b> | <b>2,923</b> |

### Measures to tackle Quasi Fiscal Deficit

21. **Tackling the non-payment Problem.** Fundamentally, the non-payment problem in Uzbekistan is largely a result of the government policies to ensure energy self-sufficiency and promote maximum import substitution in industry with little commercial considerations. For example:

- The Law on Natural Monopolies (Article 8) specifically imposes that the natural monopolies must provide their goods and services to certain customers regardless of payment by such customers.
- Annex 4 of the Decree on Natural Gas delivery includes all electricity power plants in that category of ‘certain customers’ to whom gas supplies cannot be cut-off irrespective of payment status.
- Certain gas consumers such as mining and chemical complexes, are given the right to suspend payments for gas for up to 120 days.

22. Moreover, the energy companies themselves do not appear to go aggressively after the poorly paying medium and large industrial customers that are not covered by these legal provisions. The high inflation environment such as that prevailing in Uzbekistan poses an additional burden on the enterprises, because the value of the receivable is eroding every day. **It is imperative that the Government takes immediate actions to remove all such legal impediments to commercial discipline and financial viability of the sector, including passage of laws and decrees, to overcome this problem.**

23. **Tariff Adjustment.** The Government should recognize that appropriate pricing of energy commodities and products are fundamental to the financial viability of the sector. Investment financing comes from three main sources, a company’s internal resources (i.e., retained earnings), borrowings and external equity contributions. Tariffs provide the foundation for mobilizing capital from these three sources – first to meet all costs and allow for accumulation of surpluses for investment inside the enterprises; second to adequately pay the interest and repayment on borrowing; and third to provide returns on equity capital.

24. The Government has initiated price adjustments in the energy sector since August 2001. In 2002 and the first quarter of 2003 there have been several electricity, gas, and other energy products and commodities tariffs increases, roughly once every two month. The comparisons of July 2001 and June 2003 tariffs/prices are shown in Table 5. Over this period of time electricity tariffs increased by 170% in nominal terms, gas retail tariffs by 130%, crude oil price by 34%, and light petroleum products prices by a 15-40%. In terms of USD (using the nominal market exchange rate<sup>5</sup>) electricity tariffs increased by 66%, gas retail tariffs increased by 41% and light petroleum products retail prices increase insignificantly; but crude oil price declined by 17%, light petroleum products wholesale prices dropped by 12-30%, and fuel oil price declined by 10%. The details of energy tariffs/prices evolution are presented in Annex 3.

**Table 5. Evolution of Energy Prices July 2001 – June 2003**

|                          | July 2001  |                 | June 2003  |                 | Percentage of increase |                     |
|--------------------------|------------|-----------------|------------|-----------------|------------------------|---------------------|
|                          | Soum/kWh   | UScents/<br>kWh | Soum/kWh   | UScents/<br>kWh | In Terms of<br>Soum    | In Terms of<br>US\$ |
| <b>Electric Power</b>    |            |                 |            |                 |                        |                     |
| Wholesale                | 4.80       | 0.78            | 13.10      | 1.30            | 173                    | 68                  |
| Retail                   | 4.70       | 0.76            | 13.10      | 1.30            | 179                    | 71                  |
| Weighted Average Tariffs | 4.70       | 0.76            | 12.73      | 1.26            | 171                    | 66                  |
| <b>Coal</b>              | Soum/ton   | US\$/ton        | Soum/ton   | US\$/ton        |                        |                     |
| Wholesale                | 6,750      | 10.92           | 18,300     | 18.18           | 171                    | 67                  |
| Retail                   | 3,500      | 5.66            | 5,650      | 5.61            | 61                     | -1                  |
|                          | Soum/KCM   | US\$/KCM        | Soum/KCM   | US\$/KCM        |                        |                     |
| <b>Natural gas</b>       | m3         | m3              | m3         | m3              |                        |                     |
| Wholesale                | 7,140      | 11.55           | 17,700     | 17.58           | 148                    | 52                  |
| Retail                   | 3,333      | 5.39            | 7,657      | 7.61            | 130                    | 41                  |
| Of which: for cooking    | 3,333      | 5.39            | 7,657      | 7.61            | 130                    | 41                  |
| for heating              | 1,545      | 2.50            | 3,550      | 3.53            | 130                    | 41                  |
| <b>Oil/Oil products</b>  | Soum/ton   | US\$/ton        | Soum/ton   | US\$/ton        |                        |                     |
| Crude oil, Wholesale     | 16,000     | 25.88           | 21,500     | 21.36           | 34                     | -17                 |
| Oil products, Wholesale  |            |                 |            |                 |                        |                     |
| Gasoline (A-72, A-76)    | 195,000    | 315.40          | 227,500    | 225.99          | 17                     | -28                 |
| Gasoline (A-92, A-93)    | 240,500    | 388.99          | 273,000    | 271.19          | 14                     | -30                 |
| Diesel fuel              | 93,000     | 150.42          | 132,686    | 131.81          | 43                     | -12                 |
| Fuel oil (Wholesale)     | 13,900     | 22.48           | 20,400     | 20.27           | 47                     | -10                 |
| Oil products, Retail     | Soum/liter | US\$/liter      | Soum/liter | US\$/liter      |                        |                     |
| Gasoline (A-72, A-76)    | 150        | 0.24            | 255        | 0.25            | 70                     | 4                   |
| Gasoline (A-92, A-93)    | 180        | 0.29            | 295        | 0.29            | 64                     | 1                   |
| Diesel fuel              | 150        | 0.24            | 255        | 0.25            | 70                     | 4                   |
| <b>Exchange Rates</b>    |            |                 |            |                 |                        |                     |
| OER                      | 388.08     |                 | 971.10     |                 |                        |                     |
| CER                      | 688.04     |                 | 972.25     |                 |                        |                     |
| Curb ER                  | 963.55     |                 | 1060.00    |                 |                        |                     |
| Nominal Market ER*       | 618.27     |                 | 1006.66    |                 |                        |                     |

<sup>5</sup> Nominal Market exchange rate calculated as 0.6 x OER + 0.4 x CurbER

25. There are no firm indications of what is the frequency, level and coverage of increases. The decision to increase prices and tariffs is reported to have been confirmed in a Cabinet of Ministers Resolution, but this is supposed to be a 'secret resolution' and outside agencies and many inside agencies are not given access to it.

26. *A large increase in prices of all energy products and commodities, including gas and electricity, is urgently needed.* The government's chosen reform program for UNG and UE views privatization as the primary mechanism to mobilize investment finance. However, domestic and foreign investors will shun unprofitable sectors and businesses. Therefore, the sector should be put on a sound financial footing before the investors are invited to invest. To achieve this:

- **the Government should continue the implementation of the tariff increase program.** Since large, but infrequent increases pose difficulties for consumers, Government is rightly increasing the tariffs of energy constantly in small steps. However, the tariff increase program should be made transparent, as it appears to be ad hoc. For instance, the Government should announce a program for the next 24 months, which increases the tariffs by a fixed percentage (e.g., 6% or 7% per month since 2% per month is needed to just keep pace with inflation)<sup>5</sup>. Announcement of this tariff increase program will help remove uncertainties, and allow for consumers to plan for reduction in consumption. It will also build credibility with the investors for the Government's efforts to make the sector profitable
- **In parallel, the Government should design, fund and start implementing a social protection scheme that targets reasonable energy subsidy to the poor.** While investors are desirous that the tariffs levels should be adequate, they also realize that necessary tariffs increases to reach the desired level may need to be achieved over a medium term time frame. International experience indicates that sharp and quick tariff increases have led to political and social backlash, anti-investor sentiment and to increased thefts and even harassment of company executives. The very need for a slower tariff growth path, and the fact certain portions of population would need protection for a long time, would give rise to social protection costs, the Government needs to commit to finance social protection costs and also mobilize the necessary funding for such protection costs. In addition, the management of the funds earmarked for social protection should be transparent and hopefully with a credible third party to give comfort to the investors that such funding is available and will be disbursed in time.
- **For the medium and long term, Government should design a Tariff Policy that provide producers, consumers and investors with: (i) a clear view of the principles of tariff setting and (ii) comfort that the tariff policy will be administered transparently and predictably.** Tariff levels should be sufficient to cover operating costs, debt service, mandatory capital expenditure and to offer an attractive return on equity capital. At the same time, clear rules for future automatic adjustment of tariff,

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<sup>5</sup> A 6% increase per month over the overall 24 month would bring the tariffs to about 3 USc/kWh; while a 7% increase would bring them to 3.7 USc/kWh

especially for things such as inflation/exchange rates fluctuations need to be documented. Finally, investors would look for implementation of the tariff policy by an independent and highly professional regulatory agency, combining technical and economic regulatory responsibilities over the energy sector, and as free as possible from political interference.

27. **Measures to address operational inefficiencies.** Significant investments are needed to address operational inefficiencies and improve reliability in the sector. Estimates of the total investment requirements in the electricity sector would be around US\$ 2 billion over the next 3 to 5 years, although financing constraints and the capacity to implement such a large capital investment program may require stretching the program over the next 5 to 10 years at some risk to the reliability of the Uzbek electricity system, particularly in generation. In addition, another US\$1 billion would be needed in the hydrocarbon sector, amounting to US\$ 3 billion over the short to medium term. The Government has chosen the policy of privatization and private sector involvement in the sector to mobilize such investments. The effectiveness of such policies is discussed in the next section.

28. However, some measures can be taken to reduce the commercial losses in the sector, which emanate from commercial operations – metering, billing and collection.

- **Metering** is a chronic problem in the sector. For example in the gas sector, only 6% of the 3.5 million households who have been given access to the gas network had meters at the beginning of 2002, resulting in significant losses, of over 25% of the gas supplied to BoskommunGas. In the electricity sector, although there are meters, it is likely that the meters need replacement, since many of them are not functioning properly, due to the age of the meters, and due to the increased loads that each consumer is now drawing from the network.

Recognizing the seriousness of the problem, the Government has decreed an aggressive metering program for household gas consumers, which calls for metering every household within the next three years (3.5 million). Specific target for 2002 was to install 720,000 gas meters by January 1, 2003. Funding for purchase of 800,000 meters has already been secured through: (i) an interest-free government credit (50 billion soums for 400,000 meters), and (ii) a government-guaranteed suppliers' credit arranged through the Chinese Eximbank at semi-concessional terms (\$12.5 million at 2.5% interest, with a maturity of 10 years and grace period of 4 years) for an additional 400,000 meters. NSE BoshKommunGas is also working towards creating joint ventures with local manufacturing partners for the production and supply of an additional 300,000 meters per year. In fact 864,000 gas meters were installed in 2002 and BoshKommunGas plans to install 1,278,300 meters in 2003.

While the metering program is welcome, lack of finances for the purchase and installation of meters will hamper and delay the program. Gas meters on average cost US\$30 per meter and installation costs amount to about US\$7 per meter. Thus a total of about US\$130 million is needed for meter installation, or an additional about US\$120

million, taking into account the Chinese export credit. With the current level of net resources that BosKommunGas generates, there is no way that the target of installing 3.5 million meters within the next three years can be met, unless funded by allocation of significant public resources.

- No data are available regarding **billing** problems, but mis-billing is reported in gas distribution. First, partly due to gas connection to a business requiring approval from the Cabinet of Ministers, led to lengthy delays and encouraged illegal connections. Second, in the absence of metering, it is reported that many households run small businesses (greenhouses, bakeries, restaurants, etc) in their household premises, since irrespective of the volume of consumption of gas, the consumer is billed on the basis of norms, and the current average bill for a residential gas consumer is slightly over 1,000 soums/month (less than \$1 per month). Third, there are different tariffs for gas for heating (very low at \$3.41 per KCM) and for cooking (higher at \$7.35 per KCM), and there is no way of differentiating the purpose of gas use for proper billing. Fourth, despite the low prices for gas, there are discounts offered large number of residential gas consumers. Table 6 provides the % of households receiving subsidies for electricity and gas.

**Table 6. Distribution of Energy Subsidies among Households**

|               | Percentage of households receiving subsidies |     |
|---------------|--|-----|
|               | Electricity                                  | Gas |
| Quintiles (*) |  |     |
| Poorest       | 5.2  | 2.9 |
| 2nd           | 8.1  | 4.8 |
| 3rd           | 8.5  | 5.7 |
| 4th           | 10.4   | 6.7 |
| Richest       | 13.1   | 7.7 |

These subsidies are not directly related to income levels nor necessarily targeted to the poor, but are based on occupational (doctors, teachers, for instance) or other characteristics (veterans, invalids, victims of Chernobyl, etc). **The analysis of the present policy of energy subsidy to households is presented in a separate chapter of the CEM.**

- **Collection** problems are reported to be fewer from residential consumers, partly because of very low tariffs, partly due to a strong respect for the Authorities' power. However, as discussed earlier, there is a significant inter-enterprise arrears problem, whether legally sanctioned or implicitly condoned by the utilities, and this needs to be addressed immediately.

## Chapter III: Sector Reform and Privatization

### The Electricity Sector Reform Program

29. Recognizing the problems faced by the sector, the Government adopted a Reform Program for electricity sector, to address the following problems identified by the Government:

- a complicated and highly centralized management system;
- a high degree of monopoly in generation and distribution;
- high losses; few incentives to improve energy efficiency and energy savings; deterioration of service quality; and
- inability to accumulate sufficient resources internally for reconstruction, technical refurbishment and further development of power generation facilities and grids.

30. The President Decree #UP-2812, issued on February 22, 2001, and several Resolutions of the Cabinet of Ministers (CoM) defines the policy stance of the Government as regards the Program. To elaborate briefly:

- Decree # UP-2812 calls for : (i) the de-monopolization of the electricity and coal sectors, (ii) establishment of the regulatory body for the sector, (iii) corporatization of the Ministry of Energy into UzbekEnergO, and (iv) further restructuring of UzbekEnergO, leading to eventual privatization of power plants and distribution companies.
- CoM Resolution #93 of February 24, 2001, among other things: (i) sets up the Supervisory Council for UzbekEnergO (an inter-ministerial committee) charged with the responsibility of carrying out the restructuring; (ii) details the unbundling of generation and distribution businesses; and (iii) identifies which assets/businesses will be offered to private investors and which would remain with UzbekEnergO and/or the State;
- Resolution #94 of February 24, 2001 details the organizational structure, staffing and the functions of the regulatory agency, the “State Supervisory Agency for the Electricity Sector”.
- Government Resolution #119 dated March 9, 2001, which focuses on privatization and has a rather large scope, identifies four thermal plants for privatization, one in 2001 and three for 2002.

31. The above decree, together with the CoM resolutions also constitutes the current sector-specific legal framework for the electricity sector.

32. The objectives of the Reform program (as stated in the President’s Decree and Government’s Resolutions) are to:

- improve management practices;

- mobilize investment, including foreign investment, on a large scale to develop, reequip and modernize energy and coal mining enterprises; and
- improve service quality and reliability.

33. Demonopolization and corporatization are seen as the main vehicles to better understand the cost structure and profitability of the different components of the energy system, and to increase efficiency, transparency and accountability in the management of the sector. Privatization is seen as the main vehicle to mobilize resources to meet current and future capital needs – particularly those of the rapidly aging thermal power plants.

34. *As regards the Content of the Reform Program*, it envisages an evolution of the Uzbek Electricity Supply Industry (UESI) into a functionally unbundled and partially privately owned industry in several stages over a period of 5 years, as follows:

- Abolishment the Ministry of Energy and Electrification and create a state joint stock company in its stead (UzbekEnergo JSC) that inherits the functions formerly exercised by the Ministry, as well as the state assets it managed and its liabilities.
- Establishment of three subsidiary companies of UzbekEnergo - on coal mining; on electricity transmission and on electricity distribution and sale.
- Establishment of a State Agency for supervision of the operations of the energy sector - UzGosEnergoNadzor. This regulatory agency has authority over electricity, coal and heat energy. It reports to the Cabinet of Ministers<sup>6</sup>,

35. The first step in this evolution has already been implemented – UzbekEnergo has been established as well as UzGosEnergoNadzor. There are subsidiaries for, among others, 7 thermal power plants, 6 hydropower plants, 3 heat-only power plants, one transmission company, and 15 distribution companies.

36. Government Resolution #93 provides further details on the further unbundling and privatization of UzbekEnergo. It calls for:

- the gradual corporatization of the thermal power plants and regional distribution networks;
- the offering of up to 49 percent of the capital of the above corporate entities to investors;
- the sale of a minimum of 75 percent of the shares of enterprises and organizations involved in design, civil works and maintenance formerly under the Ministry;
- the transfer of the assets and operating responsibility of the heat-only plants to local governments; and
- it also lists the social infrastructure facilities of UzbekEnergo to be privatized.

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<sup>6</sup> as does its counterpart agency, the “Oil and Gas Inspectorate” (UzNefteGazInspektsiya) that exercises similar responsibilities over the other components of the energy system.

37. The Decree further identifies key components of the electricity system that will remain state-owned under the full responsibility of UzbekEnergO. These components include all the hydro power plants, the energy network communications system, the transmission grid (UzElectroSet) and an affiliated company of UzbekEnergO that will handle commercial transactions between generation and distribution as well as export sales (UzEnergoSbyt).

38. **Industry Structure.** The currently adopted sector structure does not meet the objective of eliminating monopoly situations in the sector. In fact, UzbekEnergO, through its two fully owned companies, UzElectroSet (transmission system) and UzEnergoSbyt (single buyer and single seller of bulk power), will remain a powerful monopoly. Further, because only a minority shareholding is planned to be offered to the private sector UzbekEnergO will be at the same time the only buyer as well as the majority shareholder of the privatized generation entities. UzbekEnergO will be negotiating with itself transfer pricing (i.e., power purchase prices). Given the monopsony situation and the potential for conflict of interest, private investors will have no enthusiasm to invest in the generation plants. Moreover, the creation of the current industry structure does not seem to be based on an assessment of the financial viability of the different components of the industry.

39. Therefore, the industry structure for the electricity sector needs to be revised. In order to inculcate market orientation in the energy sector, the following principles of an industry structure design should be adopted:

- UzbekEnergO should not buy from the generation companies and sell to the distribution companies but become a transmission service company that would provide the transmission services for a fee on a ‘common carrier’ basis (i.e. non-discriminatory access to the grid);
- The generation and distribution companies should enter into direct contractual arrangements (power purchase agreements), subject to review by the Regulatory Agency;
- Even during the transition and privatization phase, the generation and distribution businesses need to be separated from UzbekEnergO (i.e., the Trust Management responsibility should be removed) and the ownership rights over the separated entities should be transferred to some other state agency prior to privatization.
- The proper basis for the (design of an) industry structure is, without doubt, the financial viability of the individual enterprises; and in the aggregate, the viability of the whole sector. Financial viability should be understood as the level of profitability that provides attractive return to private investors.

40. The Government recognizes the need for further evolution of the industry structure along the lines mentioned above. A statement of principle accompanied with a tentative timetable should be issued by the Government, perhaps through a Presidential decree or Resolution of the CoM, which would provide investors with a vision of the Government’s plans for the future of the industry.

41. The definition of an appropriate industry structure based on the above principles, together with the assessments of investment requirements and tariff policy, is critically needed, and the Government should urgently undertake efforts to mobilize the necessary financing for this purpose.

42. **Sector Regulation.** As mentioned earlier, UzGosEnergoNadzor (UGEN) has been established as the regulatory body for the electricity, heat and coal sectors. However, UGEN's regulatory scope covers only technical standards, operating norms and monitoring/control function over the industry and energy use. Decree #94 does not specifically give UGEN economic regulation responsibilities, although it specifies that it has a role in "the creation of a favorable environment for bringing foreign investment", but its role is not clear. However, while UGEN might review tariff requirements and recommend tariff adjustments necessary to fulfill that role, the Ministry of Finance keeps its authority over approval of end-user consumer tariffs. In other words, the economic regulation of the electricity sector is carried out by the Ministry of Finance, which is also responsible for economic policy. Investors will look for a regulatory system that is independent from the political system (i.e., the Government), and from the operators (i.e., UzbekEnergo and its future spin-off companies), and one that is transparent and open to public scrutiny.

43. To create the conditions for an efficient electricity market and attract private investors, an effective regulatory system would include the following elements:

- scope of regulation – clearly the technical and economic regulatory aspects should be combined into a single entity; and it is often highly desirable to combine regulation of electricity with that for gas, heat, coal, and petroleum products. This is especially true for Uzbekistan, where the gas and electricity industries are very tightly interlinked.
- form of regulation - whether to adopt a legislation based regulation (such as an electricity law), which entails issuance of a license to the operating entity; or whether to adopt a contract based regulation where the key elements of construction, operations, maintenance and performance are stipulated in several contracts (such as a Concession Agreement, or a collection of Power Purchase Agreement, Fuel Supply Agreement etc.);
- content of regulation - technical regulation involving construction standards and operations standards to achieve the highest efficiency, safety and minimum environmental impact. Economic regulation involving setting and monitoring the prices for different categories of consumers and selecting the form of price regulation to be adopted (cost plus a predetermined profit, Inflation less a percentage for forcing efficiency improvement, etc);
- regulatory processes - these include processes for technical review, price review, compliance review as well as processes for dispute resolution;
- structure of the regulatory institution – a single person regulator as the in UK or a regulatory commission (or board) as in the US and many other countries; and
- independence of the regulatory institution - this is the most critical aspect of the regulatory framework and involves decisions as regards its reporting relationships, its

financial independence, and the appointment, length(s) of service and especially the termination of the regulators.

44. The formulation, development and realization of a well functioning regulatory body for the energy sector is a time consuming effort and requires considerable technical assistance. The Government should urgently undertake efforts to mobilize the necessary financing for this purpose.

45. **Privatization Approach.** The Government proposes to offer only a minority shareholding to investors. Investors would show, in all likelihood, little interest in such an offer. Uzbekistan is one of several countries ‘competing’ for investors’ capital at a time when foreign investors are showing less interest, compared to the mid-90s, to invest in developing country power sectors. To attract the large amount of capital required for its energy sector, Uzbekistan needs to demonstrate that it is willing to offer a highly competitive package to outside investors. Therefore:

- The Government should announce that it is willing to consider all manners of privatizations – asset sales, concessions, joint ventures, and even management contracts, for businesses where investor interest is low.
- The Government should change the proposed asset sales privatization approach and announce upfront that it is prepared to offer majority shareholding to private investors in the privatized entities, up to 70% or 80% of the shares; and
- Further to the extent the state continues to be a (minority) owner, this state ownership should be exercised by an agency other than UzbekEnergo to avoid what investors would see as a potential conflict of interest.

46. The Government should, with the help of professional expertise, devise an appropriate privatization strategy.

### **The Hydrocarbon Sector Reform And Privatization Program**

47. Uzbekistan considers the expansion of its petroleum and gas sectors as vital to achieving national security. A primary objective of the petroleum sector is to meet the country's need for oil, gas, and their associated products and to expand energy exports. However, to offset declining production of oil at some of the country's older fields, the Government recognized the need to replace the reserves by accelerating exploration and development at existing deposits and undertake exploration for new resources.

48. Due to low tariffs, the resource constraints faced by the sector are significant, and in recognition of this, the Government has provided, directly or indirectly through sovereign guarantees, a large amount of public resources to expand the development of the hydrocarbons industry and particularly to increase exploration and development activities. However, the Government recognizes the limitations of public financing and, since 1997, has undertaken

efforts to attract additional private capital and technology assistance. While the overall investment environment remains a handicap to attract FDI, trends and events in the past two years have combined to make the hydrocarbon sector potentially more attractive. In particular, Uzbekistan recently concluded agreements to export natural gas to Ukraine through Gazprom pipelines, and there is progress on the Caspian-area oil export pipeline routes. Accordingly, the Government has pursued a two-pronged approach to soliciting private sector interest – the first through the offering of new exploration blocks to foreign oil companies under production sharing agreement; and second through the privatization of the national oil and gas company – UzbekNefteGas (UNG).

49. **Promotion of Exploration Blocks.** In 1997, Uzbekistan presented for the first time detailed information on potential investment projects aimed ultimately at increasing hydrocarbon production and turning the nation into a modest net exporter of oil and gas. In mid-1998 Uzbekneftegaz offered six oil and gas exploration and development license areas near the Aral Sea to foreign operators.

50. In addition, based on the feedback received from the foreign investors, on 28 April 2000, a new oil and gas decree, UP-2598, was put into effect, paving the way for increased foreign investment in the country's oil and gas industry. This decree offered a number of new incentives and tax breaks to foreign investors and offered exploration acreages under concessions to investors in the Ustyurt region, and other promising oil and gas areas. It is important to note that this decree also gave greater authority and responsibility to UNG over every aspects of the development and operation of the industry.

51. The first, and so far the only, real success in attracting private investors for new exploration is the production sharing agreement ("PSA") by "UzPEK" – a special-purpose subsidiary of the independent Trinity Energy of England, for exploration and development of multiple fields in the Central Ustyurt Plateau and Southwest Hissar regions. The UzPEK PSA was signed approved and signed in April 2001. The UzPEK project's volume of investment is budgeted to be \$480 million over a 10-year period, with the anticipated production to be 140 BCM of natural gas and 50 million tons of liquid hydrocarbons. It must be noted that in the decree and follow-on Cabinet Of Ministers resolution that approved the UzPEK PSA, additional preferential rules were included over and above those in UP-2598.

52. Another possible agreement was announced in July 2001 for a multiple region PSA involving Lukoil of Russia and the U.S.-based (but Gazprom-linked) Itera. This E&P project also encompasses multiple fields, in the Bukharo-Khivinsky and Hissar regions; with an announced \$750 million of potential investment, and expected production of 250 BCM of gas and 10 million tons of liquids. It is not clear whether this agreement has been formally concluded, and it appears that no investments have yet actually taken place.

53. As such the results of the Government's efforts in this regard are fairly modest. Only one PSA has been signed, and even then there are no movements towards actual investment. It is possible that financiers may be reluctant to finance the PSAs in Uzbekistan at the current time.

Uzbekistan's uncertain legal regime, currency convertibility problems, distance from pipelines and world markets, and policies favoring domestic consumption and refining development over hydrocarbon export have combined to retard foreign investment in Uzbekistan's oil and gas development in the first post-Soviet decade. These problems continue to haunt the country and sector even today.

54. **Privatization of UNG.** The second approach adopted by the Government to attract foreign investments to the sector is through the privatization of UNG.

55. UNG is an integrated state-owned oil and gas company responsible for managing the entire oil and gas sector of Uzbekistan and was established by the Decree of the President of the Republic of Uzbekistan No. UP-2154 dated 11 November 1998 and followed by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 523 dated 15 December 1998 “On organization and activity of UzbekNefteGaz National Holding Company”. UNG is organized as a holding company and has several subsidiaries. The main subsidiaries of UzbekNefteGaz include:

- UzgeoNefteGazDobycha which is in charge of exploration and production (E&P) of oil, gas, and condensate along with gas processing;
- UzTransGaz which owns the trunk pipelines and handles gas transportation and delivery;
- UzNeftePererabotka which owns all of Uzbekistan's oil refineries plus the Shurtan Gas Chemical Complex;
- UzBurNefteGaz which owns companies that engage in exploratory and production drilling and is the only drilling company in the republic;
- UzNefteProduct which sells oil products within the Uzbekistan territory; it operates on the retail market through its ownership of all petrol stations and on various wholesale markets;
- UzNefteGazStroy which specializes in building and assembly works in the oil and gas industry;
- UzAvtoGaz which produces and retails alternative vehicle fuels such as compressed natural gas (CNG) and liquid petroleum gas (LPG); and
- UzNefteGazMash groups enterprises producing machinery and equipment for the chemical industry and the oil and gas sector.

56. UNG and its subsidiaries - UzNefteGazDobycha, UzTtransGaz, UzNeftePererabotka, UzBurNefteGaz, UzNefteGazMash, UzNefteProduct, UzAvtoGaz have been selected as top priority candidates for privatization through sale of their shares to foreign investors in accordance with the terms and conditions, stipulated by the Resolution No. 119. Here too, the plans are to sell a maximum of 49% share in each of the companies while the state retains 51%. The responsibility for privatization, and for corporate governance until privatization, rests with GKI.

57. With technical assistance from the EIBL, a group of consultants, led by Banque Nationale de Paris - Paribas (BNPP), have been working for the past year or so, and have undertaken a diagnostic study of the UNG and its legal, regulatory, operational, technical, and financial status, from a point of view of privatizing UNG in accordance with the Decree #119 on Privatization, which is based on the Law on Privatization of 1991.

58. From the diagnostic report it is evident that significant preparatory work is needed in order to realize privatization. The work required is varied, ranging from administrative questions, possibly within the remit of the GKI/CCPB, to those that will require evolution of relevant laws and decrees, within the orbit of Ministries and other Government Agencies. What is required is a clear consensus, political will and a road map to remove obstacles and achieve a successful privatisation in an acceptable time frame. The main elements of the required reform are mentioned below.

59. **Legal Framework.** Despite the Decree No. UP-2154 and Resolution 523, uncertainty exists in terms of whether UNG owns its assets or is it a company vested with the management rights for the businesses of its subsidiaries. There is a 'secret' decree No. 176-29 dated May 3, 2000, which appears to have removed the rights of UNG (if such rights are anticipated in Edict No. UP-2154) to manage (directly or indirectly) the Controlled Companies through the shares that the State retains in its possession.

60. Then there are several laws and articles that clearly interfere with the commercial operations of the enterprises in the sector. Primarily, Article 4 of the Law on Natural Monopolies states that any activities of companies in the area of oil and gas production and transportation are subject to State regulation as natural monopolies. Therefore, all of the UNG Subsidiaries that operate in the area of oil and gas production and transportation should be subject to State regulation as natural monopolies. As described earlier, there are also significant legal impediments to the development of market-based commercial relationships between gas suppliers and their large clients and to the introduction of financial discipline.

61. UNG subsidiaries have to receive approval from the Ministry of Finance for the prices that they charge for their goods and services and, for certain goods and services, have to charge prices that the Cabinet of Ministers establishes.

62. In addition through decrees and resolutions, UNG and its subsidiaries face the following problems:

- In general, Companies are not able to control cash received<sup>7</sup>, manage pricing to cover all costs and administrative overheads, or sell products to any entities other than those listed in special resolutions of the Ministry of Finance and Anti-monopoly Committee.

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<sup>7</sup> The special regulation No.1021 pertaining to the processing of payments from accounts of UNG's, approved by the Ministry of Finance is a case in point to demonstrate the micro-management by the government. This regulates distribution of cash received by, for example, UzGeoNefteGazDobycha (E&P subsidiary) as follows: 46.4% to the state budget for payment of taxes; 43.3% for payment of salaries and wages; 4.4% to NHC for repayment of loans; 1.6% to NHC for import of materials and equipment;1.3% for investments;0.9% security services; 0.4% for rail road services; 0.2% road fund; and 1.5% for priority expenses needs.

Moreover, the companies must sell their products to entities (mainly agricultural) at low prices or to insolvent entities, which exposes the companies to bad debts and losses.

- Export of products produced by some subsidiaries is performed only through a separate entity “UzVneshNefteGaz”, which is a subsidiary of UNG and is not included in the list of subsidiaries to be privatized. This entity accumulates all foreign currency proceeds from export of UNG’s products, and then remits soums to other subsidiaries of UNG.
- Settlements between subsidiaries are usually carried out under special schemes approved by the Cabinet of Ministers, which provide non-cash settlement of accounts receivable and payable within the NHC group. Settlements outside the NHC group are made in cash, i.e. via direct bank transfers.

63. There is an urgent need to remove these legal barriers to proper corporate governance, and to proper commercial operations appropriate for a market economy. **In addition, in order to bring transparency and consistency to the legal framework for the sector, a modern Petroleum Law should be drafted and enacted as soon as possible, which will help investors in new fields and also those interested in existing fields and assets.**

64. **Restructuring of UNG.** UNG, via Decree UP 2598, is the licensor of new concessions for exploration and drilling, partner in any PSAs, has its own dominant E&P position in the country, and also owns the refineries, gas processing and gas transmission companies. There is no way an investor today can negotiate reasonable terms for his investments if UNG or its subsidiaries do not agree with such terms. Therefore, concomitant with the revision of the legal framework, UNG should be restructured along standard industry practice. For example:

- The regulatory type functions (granting of licenses for E&P) should be separated into a government entity such as a Petroleum Authority, which in turn should be prohibited from being in business for itself;
- The E&P activities should be corporatized separately from oil field services (drilling etc), and the gas processing plants at Mubarek and Shurtan, should be part of this corporatized entity, in view of the close inter-dependence of the gas-chemical complexes with the two fields. In terms of market relationships, the E&P company (or companies, if each field is established as a subsidiary of the E&P company) would have contractual relationships with the refineries for crude and with the power plants and gas distribution companies for gas.
- The refineries should be corporatized into one company and marketing arm should be part of this company.
- The gas transmission company should be separated and set up as a common-carrier for transmitting gas both inside the country and for exports.
- The services companies should all be brought under one corporate entity, which will provide services (mainly to E&P) on a contractual basis.

65. The fundamental point is there is no need for a holding company any longer – once the regulatory type functions are taken away, each of the companies should be able to deal with each

other on a commercial basis, assuming of course the legal impediments to commercial operations are removed.

66. **Regulation of the Hydrocarbon Sector.** While creating the structure for the hydrocarbon industry as described above, it is quite necessary to establish a regulatory agency for the sector, which will be a professional body independent of the Government. The structure, functions and funding of this agency should be part of the Petroleum Law. The mandate of this regulatory agency would comprise technical and economic regulation as a minimum, and could include environmental aspects as well (which are closely related to technical aspects, and have an impact on the economic aspects). The functions of this agency should include granting of licenses for E&P; regulation of the monopoly aspects of the sector such as UzTransGas network, as well as gas distribution (which is currently not part of the hydrocarbon sector that comes under Fuel and Energy Complex). To the extent that retail prices of petroleum products are liberalized and the market structure at the retail end is a competitive one, the need for regulation of this end of the sector is less.

67. As a related matter, the UzNefteGasInspectia should become part of this agency. In order to reduce the costs of regulations, as well as bring concordance with regulation of other energy subsectors such as electricity, it would be perhaps useful to consider a single regulatory agency for the whole energy system.

68. **Privatization and Private Sector Participation.** The current plans of the Government call for privatizing upto 49% of the UNG holding company as well as upto 49% of each of the targeted subsidiaries of UNG. However, a preliminary market assessment of possible investors by BNPP-led consortium indicates that there is close to zero interest in the UNG holding company, and most interest was expressed for the E&P business. The interest for other businesses, refineries, and gas transmission was in-between.

69. The investor sentiments reflect the reality that international oil industry's main focus is on replacement reserves of their own E&P businesses, which they could do by acquiring E&P business of UNG. Also, there are specialized players in gas transmission and services and they would only show interest in non-E&P businesses if the terms and conditions were appropriate. Therefore, the privatization approach to UNG's businesses should be business-specific as follows:

- Private participation should be sought in the E&P business on a field-by-field basis through PSA arrangements. The advantage of this method is that there would be multiple producers of oil and gas at the end of the process so that a market is created at the supply end. Also, different producers would be more interested in a particular field than others, based on their competitive strength (some in enhanced oil recovery from depleted fields, some in deep drilling, some others in directional or horizontal drilling, etc.).
- Combining the gas/chemical complexes, Mubarek and Shurtan, with the respective fields should be given as an option to the investors.

- Strategic sale (asset sale) should be sought for the refineries, as well as for service companies. It should be recognized that the viability of refineries and service companies depends directly on the amount of investment coming into E&P.
- A concession approach would be suitable for the UzTransGas pipelines.

70. The next steps would be for the Advisory Consortium to provide the necessary clarifications, and a paper to be prepared by GKI for discussions at the cabinet of Ministers to approve the revised industry structure and privatization approach. This is expected to happen in the next few months.

### **Necessity Of Reform of the Gas Distribution Sector**

71. Reform of the Uzbekistan's gas distribution sector is absolutely critical and equally urgent for ensuring the successful reform of the hydrocarbon as well as the electricity sector, in view of the very heavy interdependence of these subsectors.

- Roughly 64% of UzbekEnergO's generation capacity is gas fired; and UzbekEnergO accounts for 30% of total domestic gas sales. About half of the UNG's gas supplied to the domestic market is supplied to gas distribution managed and operated by BosKommunGas. Viability of gas distribution sector is therefore crucial for the viability of the upstream hydrocarbon sector as well as the electricity sector.
- However, BosKommunGas's tariffs are extremely low - the consumer is billed on the basis of norms, and the current average bill for a residential gas consumer is slightly over 1,000 soums/month (less than \$1 per month). Although there are different tariffs for gas for heating (lower at \$3.41 per KCM) and for cooking (higher at \$7.35 per KCM), and there is no way of differentiating the purpose of gas use for proper billing. Moreover, despite the low prices for gas, there are discounts offered to large number of residential gas consumers.
- Then there is the problem of inter-enterprise arrears, which exists even though the gas tariffs are low. The arrears are significant, to the tune of 40 billion soums (about US\$43 million at market exchange rates) owed by UzbekEnergO to UzTransGas. However, despite such arrears, UzTransGas cannot cut off supplies to UzbekEnergO, as per Resolution #439 of the Cabinet of Ministers (dated September 21, 1999). Therefore, there is no incentive for UzbekEnergO to pay for the gas nor to settle the arrears, further bankrupting the gas sector.

72. As a consequence, there are no resources available to UzTransGas to maintain the gas transmission network; and its parent UNG has no resources for replacement of reserves. This certainly jeopardizes the reform and privatization efforts of UNG's E&P business and gas transmission business. Furthermore, there are grave doubts whether reliability of gas supply to the power plants can be ensured even in the short term, let alone the medium to long term. UzTransGas is already experiencing problems in its transmission infrastructure, as indicated by the physical problems they had in the past couple of years in their exports to Kyrgyz Republic and Kazakhstan. These problems are bound to escalate.

73. The problem appears to be one of gas distribution, being not part of UNG and therefore not under Fuel and Energy Complex, having fallen ‘through the cracks’. Discussions with the ministry responsible for BosKommunGas indicate a willingness to reform and even to consider privatization of the gas distribution activity. While Government and BosKomunGas have recognized the urgency to reduce commercial losses in the sector and have agreed on an ambitious program of gas metering, it is not clear that discussions of a more comprehensive program of reform of the gas distribution sector have taken place at the higher levels of the Government.

74. **It is imperative that the Government should decide upon and initiate a reform of the gas sector in parallel with the reform of the hydrocarbon and electricity sectors.** In addition there is a need to reform the gas sector for its own sake. There are significant synergies that can be, and should be exploited. These synergies exist in the creation of a wholesale gas market; setting up of the common regulatory framework for gas and electricity together; and at the distribution level, some electricity and gas distribution businesses could be merged (particularly in low load density areas) to create better business fundamentals and attract investor interest.

## Chapter IV: Energy Export Potential

75. Uzbekistan hopes to become a major energy exporter and the status of its efforts to realize energy exports is discussed below by each subsector. Hydrocarbon sector is currently the larger exporter among the subsectors and is dealt with in detail.

76. **Oil & Gas.** Natural gas is Uzbekistan's main energy export, in addition to refined petroleum products and crude oil.

77. **Natural Gas Exports.** The main markets are Kazakhstan, Kyrgyzstan, Tajikistan and Ukraine. In 2000, Uzbekistan exported 5.6 BCM of gas with 50% of the total being supplied to Ukraine. In contrast the export volume in 2001 declined to 4.3 BCM a direct result of declining production, the need to meet the domestic demand and problems in gas transmission infrastructure. According to preliminary data the Uzbekistan 2002 natural gas export was around 5.7 BCM. Uzbekistan supplies approximately 550 MCM of gas per year to Tajikistan of which about 160 MCM in lieu of transit fee payment for the use of the gas pipeline that crosses the northern part of the Tajikistan between Bukhara and the Fergana valley and about 200 MCM as payment for rail transit services for the Uzbek trains. Uzbekistan exports natural gas to Kyrgyz Republic and half of the payment are made through barter agreements and are linked to the Intergovernmental Irrigation Agreements between Kyrgyz republic and Uzbekistan. As a result, most of the export tariffs are not paid in cash but are very often subject to barter agreements. Export tariffs are negotiated directly between UzTransGaz and the export customers subject to approval of the Government of Uzbekistan and vary from client to client within a country; and among countries.

**Export Volumes.** Table 7 summarizes the natural gas export volumes over the last six years.

**Table 7. Natural gas export – Average Volumes (MCM)**

| Gas export market   | 1996         | 1997         | 1998         | 1999         | 2000         | 2001         |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Kyrgyz Republic     | 1 039        | 934          | 1 158        | 598          | 775          | 504          |
| Kazakhstan          | 523          | 1 829        | 1 831        | 1 398        | 1 355        | 945          |
| Tajikistan          | 563          | 882          | 755          | 747          | 729          | 416          |
| Ukraine             | 4 037        | 4 253        | -            | 1 788        | 2 759        | 2 463        |
| <b>TOTAL</b>        | <b>6 236</b> | <b>7 971</b> | <b>3 744</b> | <b>4 530</b> | <b>5 618</b> | <b>4 328</b> |
| <hr/>               |              |              |              |              |              |              |
| Export market share |              |              |              |              |              |              |
| Kyrgyz Republic     | 17%          | 12%          | 31%          | 13%          | 14%          | 12%          |
| Kazakhstan          | 8%           | 23%          | 49%          | 31%          | 24%          | 22%          |
| Tajikistan          | 9%           | 11%          | 20%          | 16%          | 13%          | 10%          |
| Ukraine             | 66%          | 54%          | 0%           | 39%          | 49%          | 57%          |

Source: BNPP Reports on UNG Reform and Privatization

**Export Prices.** Table 8 summarizes the evolution of gas export prices over the last six years.

**Table 8. Natural gas export price (US\$/KCM)**

| <b>Gas export market</b> | <b>1996</b> | <b>1997</b> | <b>1998</b> | <b>1999</b> | <b>2000</b> | <b>2001</b> |
|--------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Kyrgyz Republic          | 60.2        | 55.0        | 61.3        | 52.4        | 48.7        | 51.7        |
| Kazakhstan               | 58.0        | 45.8        | 41.5        | 41.1        | 37.6        | 40.0        |
| Tajikistan               | 63.3        | 58.6        | 57.7        | 51.8        | 46.9        | 49.1        |
| Ukraine                  | 58.0        | 40.0        |             | 40.0        | 40.0        | 40.0        |
| <b>Weighted Average</b>  | <b>58.9</b> | <b>45.2</b> | <b>50.9</b> | <b>43.9</b> | <b>41.5</b> | <b>42.2</b> |

Export tariffs include excise tax. It should be noted that most of these tariffs are not paid in full but are very often subject to barter agreements. Export tariffs are negotiated directly between UzTransGaz and the export customers subject to approval of the Government of Uzbekistan. Tariffs are differentiated for each client as shown in the Table 9 for year 2001.

**Table 9. List of Export Customers for the year 2001 and Tariffs**

| <b>Country</b>         | <b>Customers</b>                | <b>Average Volume (KCM)</b> | <b>Tariff<br/>US\$/KCM</b> |
|------------------------|---------------------------------|-----------------------------|----------------------------|
| <b>Kyrgyz Republic</b> | JSC "KyrgyzEnergo"              | 430 959                     | 54                         |
|                        | JSC "KyrgyzGaz"                 | 297 157                     | 42                         |
|                        | JSC "KyrgyzGaz"*                | 46 694                      | 40                         |
| <b>Kazakhstan</b>      | GasPex (Overseas) Co. Ltd.      | 471 465                     | 40                         |
|                        | InterGas C.A.                   | 30 721                      | 40                         |
|                        | ITERA                           | 302 520                     | 35                         |
|                        | OJSC "AlmatyInterGaz"           | 103 556                     | 35                         |
| <b>Tajikistan</b>      | TOO "JambilTorgGaz" (gas sales) | 181 002                     | 35                         |
|                        | FKII "YujTransGaz"              | 51 655                      | 35                         |
|                        | SUE "TajikGas"                  | 214 452                     | 40                         |
| <b>Ukraine</b>         | SUE "TajikGas"                  | 300 000                     | 50                         |
|                        |                                 | 201 582                     | 50                         |
|                        |                                 | 128 778                     | 40                         |
|                        | 98 547                          | 40                          |                            |
| <b>Ukraine</b>         | GasPex S.A.                     | 2 759 137                   | 40                         |

\*Possibly for cash payment

78. **Exports of Petroleum Products.** Exporting petroleum products is not a crucial mission for Uzbekistan, because meeting domestic demand is the main priority of the Government policy, and thus exports are carried out with residual products. As a result, export structure varies from one year to another both in terms of customers and in terms of products. Gasoline and

diesel represent the most important share of exported oil products. Diesel represented 56% of the total of oil products that were exported that year and 75% in 2000; and gasoline exports accounted for 12% of this total in 1999 and 18%.

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**79. Pricing of Petroleum Products for Exports.** Prices of petroleum products on export markets depend upon the terms of negotiations, and there are no rules/criteria for fixing export prices or their limits. Export prices of petroleum products always result from case-by-case negotiations.

Details of petroleum products export and export prices for the years 1999 and 2000 are presented in Annex 4.

**80. Analysis of Uzbekistan's Oil and Gas Export Potential.** Despite having significant hydrocarbon resources, Uzbekistan's exports of hydrocarbons will remain constrained in the medium term for the following reasons:

- Exports of both natural gas and petroleum products declined over the last two years, and the reasons for such declines are: (a) the policy of self sufficiency that focuses on increasing domestic consumption, which has made less resources available for export; (b) declining production from existing fields; and (c) problems in infrastructure, particularly gas transmission;
- Although Ukraine is a major market accounting for more than 50% of exports in 2001, such exports are at the mercy of Russia's GazProm, both from an infrastructure and market allocation points of view. According to industry reports, GazProm is reacting to declines in its own output of gas due to depletion of existing deposits and a lack of new production, and has begun actively to encourage Uzbekistan's export of gas through its (GazProm) pipelines. However, while this change in GazProm policy toward facilitating the export of Central Asian hydrocarbons enhances the opportunity for Uzbekistan, it should be noted that the Ukrainian market is split between Uzbekistan and Turkmenistan. Importantly, GazProm has allocated a less creditworthy market (Ukraine) to Uzbekistan and has kept the markets of western Europe and Turkey to itself.
- While Kazakhstan is a reasonably good market for the moment, gas supplies to Kazakhstan have been unreliable in the last few years, and Kazakhstan has been actively considering developing the Amangeldy gas field to meet the demand in southern Kazakhstan as an alternative.
- Kyrgyz Republic and Tajikistan are small markets, and even in these markets, gas exports are on a non-commercial (barter) basis, linked to irrigation water-cum-electricity receipts from Kyrgyz, and to obtaining transit corridors from Tajikistan.

- Pricing of gas and petroleum products is ad hoc, highly political and inconsistent. For example, the price for southern Kazakhstan is US\$35/KCM, presumably for cash payment, whereas it is US\$42/KCM in Kyrgyz Republic 50% for cash payment and 50% for barter.
- There are no long term contracts to provide price stability, and the opportunities for entering into such contracts are slim, given the general knowledge in the industry and the region about declining production and therefore unreliable supplies.
- Uzbekistan is planning to take part in the proposed pipelines to Afghanistan and beyond, but realization of such schemes is some way into the future as they have to contend with: (a) achievement of security and stability in the target countries; (b) competition from Turkmenistan, Iran (for supplies to Pakistan) and ambitions of Afghanistan to develop its own significant gas reserves; (c) transit issues; (d) high costs of building these pipelines; and (e) the capability of the target countries to pay for the gas.

81. **Recommendations.** The recommendations for Uzbek to realize its export ambitions address each of the points raised above are:

- Implementation of the reform program for the hydrocarbon sector, as described earlier in this paper, is imperative and rather urgent, in order to address the problems of declining production, and investments for infrastructure rehabilitation.
- Programs to rationalize energy consumption, in particular gas and electricity consumption, which include pricing reform, metering, billing and collection is necessary to reduce domestic consumption and make more surplus available for export.
- In the short to medium term, Uzbekistan would continue to be dependant on GazProm for accessing markets beyond Central Asia such as Ukraine. In addition to better relations with GazProm, entering into long-term contracts with such customers, supported by commitments to increase reserves (by attracting private investments to the E&P function) is a necessity.
- Uzbekistan must do everything possible to improve the reliability and timeliness of gas supply to its Central Asian neighbors or else its chances of losing this market are high. This would mean investment in UzTransGas system (pipelines and compressor stations) and entering into long-term contracts on a commercial basis with customers in Kazakhstan.
- Uzbekistan must replace its current barter-based gas exports to Kyrgyz Republic and Tajikistan with a commercial arrangement. This will require Uzbekistan to: (a) offer gas at a lower price in exchange for cash payment (as it does for customers in Kazakhstan); (b) de-link it from intergovernmental irrigation agreements (with Kyrgyz Republic) and transport corridor agreements (in Tajikistan); and (c) enter into long-term contracts perhaps directly with bulk consumers in these countries (such as BishkekGas JSC, as opposed to the Government of Kyrgyz Republic for example). The proposed private sector participation in UNG's E&P business, UzTransGas, as well as the plans to involve private investors/operators in Kyrgyz's gas distribution business will facilitate such commercial transactions.

- Uzbekistan should view the electricity supplied by Kyrgyz during the summer in a different (i.e., positive) light from the point of view of increasing its exportable surplus of gas. First, given that the LRMC of electricity production is 3.5 US cents/kWh as a minimum, Uzbek authorities should be willing to buy Kyrgyz electricity in the summer, as long as the price is lower than this level on a commercial basis (i.e., for cash). Even assuming that UzbekEnergo has enough capacity to meet its summer demand (which is not the case, in view of the age of plant and growing summer peak demand), Uzbekistan can back-down its gas-fired thermal plants, replace the supply with hydroelectricity from Kyrgyz, and save and store the gas to create an exportable surplus. This would perhaps require gas storage facilities, or alternatively, gas production can be curtailed during the summer, to save the reserves.

82. **Coal.** In spite of fact that during recent years volumes of coal export/import were insignificant, the UzbekUgol aspires to increase coal export, particularly to Afghanistan. Between January and March 2002, 6,500 tons of coal were supplied from Shargun to the northern part of Afghanistan at a price of \$37/ton. UzbekUgol estimates a potential market of up to 200,000 tons for Afghanistan alone. Because of the railway link, Northern Afghanistan indeed appears to be a possible market for reasonable quantities of Uzbek coal if payments issues are resolved. It appears that UzbekUgol has also been in preliminary discussion with Iranian representatives for the supply of coal to certain parts of Iran.

83. **Electricity.** In the short-run, electricity export opportunities will remain limited by generation constraints in the Uzbek system. Although the installed capacity is 11,200 MW, the operatable capacity is only 7800 MW, and the current peak demand (2001) is about 7400 MW, leaving very small reserve margin for meeting a growing demand. Add to it the very old plant in the system, and declining gas production, it is difficult to foresee Uzbekistan being in a position to export electricity in the short to medium term, other than those for system balancing on the Central Asian Power System.

84. UzbekEnergo is nevertheless considering that recent developments in Afghanistan offer modest export opportunities. At present, the installed capacity in Afghanistan is only 480 MW, and only 6% of the population is connected to electricity. No new power facility has indeed been built since 1982. UzbekEnergo has estimated that it could potentially sell 300 GWh of electricity per year to the northern province(s) of Afghanistan through the only existing transmission line connecting Uzbekistan to Mazar-i-Sharif. The line itself has a 220 kV voltage rating, but can only be used at 110 kV, as the transformer in Mazar-i-Sharif is only of 110 kV voltage. Further supply of electricity to Kabul and other parts of Afghanistan would require rebuilding the line connecting Mazar-i-Sharif to Kabul destroyed during the conflicts. UzbekEnergo's claims are that with the completion of the first unit (800 MW) at Talimardjan TPS, it would have the capacity to supply export markets. However, this may be wishful thinking because it is quite certain that this additional capacity is needed to meet domestic demand, and allow for plants

such as 1800-MW Tashkent thermal power station which has received funding from Japanese for rehabilitation, can be taken-out of service for rehabilitation.<sup>8</sup>

85. It is worthwhile to note that Uzbekistan's neighbors, Tajikistan and Turkmenistan (which share long borders with Afghanistan), as well as Kyrgyz Republic, are working towards capturing the Afghanistan power market. In addition, Afghanistan would be looking to develop its own resources. Therefore, one option for Uzbekistan would be to work in partnership with one or more of its neighbors to create an export consortium to capture export markets for electricity, over the long-term. However, before that a few questions need to be answered: (a) what are the domestic demand/supply options for Uzbekistan for the next 20-25 year period; (b) how much surplus would be available for export and at what price; and (c) what are the real markets for Central Asian electricity over the long term. These questions would be answered in the proposed Bank's Economic and Sector Work task for a "Regional study of potential sources of supply and markets for power in Central Asian Electricity" planned to be completed by end-2004.

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<sup>8</sup> UzbekEnergO is also interested in supplying Uzbek manufactured equipment, such as cables, transformers, commuting equipment, pipe work, and spare parts, as well as technical expertise for the reconstruction of the energy infrastructure of Afghanistan. Uzbek technical experts and Uzbek-manufactured equipment were indeed massively used to design and build the electricity infrastructure of the country undertaken in Soviet time and UzbekEnergO believes this gives Uzbekistan a competitive advantage to contribute to quickly and inexpensively assist in the rebuilding of the power infrastructure of the country. Like for coal, however, payment issues need to be resolved to make Afghanistan a financially attractive export market for Uzbek electricity, energy engineering expertise and power equipment.

## Chapter V: A Road Map for Reform

86. The Government faces some critical challenges in realizing the oil and gas export potential and in meeting its electricity demand in a sustainable way. The country's oil and gas reserves need to be replaced with identification of additional reserves, the deterioration in energy infrastructure should be arrested and energy should be used more efficiently. To achieve these objectives requires large investments - a sizeable part of which should come from foreign investors - as well as modern technology and know-how.

87. The Government has indeed chosen the option of attracting private investments by means of a sale of portions – mainly minority stakes – of SOEs responsible for oil and gas production, transportation and refining, and electricity sector, to strategic foreign investors. In this regard, international experience over the last ten years, in transition economies as well as other developing countries, points to a few key lessons that should be considered. First, appropriate pricing of energy commodities and products is fundamental. Second, a strong demonstrated commitment to enforce financial discipline is necessary. Third, investors require majority stakes in strategic sales, but also are willing to consider other options for private sector participation. Fourth, for segments of the industry that have a monopolistic nature (e.g., transmission of gas and electricity) and a utility service function (e.g., gas and electricity distribution), an appropriate legal and regulatory framework should be in place. Fifth, completing the reform of the energy sector is a time consuming process, and could take up to ten years. Lastly, while the entire reform process would take a long time, critical actions should be initiated immediately. The following paragraphs discuss how Uzbek authorities can draw upon these lessons to devise their strategy aimed at developing the country's energy sector with the help of private investments.

88. As regards pricing, given the significant distortions in the current energy pricing regime, the pricing adjustments would need to start without delay but be implemented in phases, and over the medium term. The *first phase* could involve liberalizing petroleum and coal prices, and *initiating* a program of gradual real increases in gas and electricity prices. *Liberalizing petroleum and coal prices* quickly, recognizing the opportunity value associated with export markets for oil and coal, would yield significant gains at low costs, since they are more readily exportable than gas, and their price increase would induce efficient domestic consumption and not affect the poor as much since they are consumed less by the poor both directly and indirectly. Price increases for electricity, gas and heat may be modest in the first phase, although real increases should continue, since time is needed to introduce a reliable social protection mechanism for the poor. Finally, an important element of the first stage should be the development, publication and implementation of a *medium term tariff policy* for all utility services, including gas and electricity.

89. With regard to commitment to enforce financial discipline, steps to reduce commercial losses should be undertaken urgently by addressing key issues such as non-payment of bills, inadequate metering, and utility privileges. Particular emphasis should be placed on the *improvement in payment performance by state owned enterprises and eliminating legal restrictions to cutting off energy supply to non-paying enterprises*. Reducing future non-payment

by state enterprises would also harden budget constraints and induce enterprises to restructure and become more competitive. The Government has also recognized the importance of reducing commercial losses and has started an ambitious program of gas *metering*. Such program of metering (or re-metering with accurate and tamper-proof devices) should be carried out in the electricity and heat sectors as well.

90. The *second phase* of the energy reform, could then focus on more aggressive gas and electricity tariff increases, by which time metering should be more widespread; a tested, functioning social protection mechanism for energy would be in place; and also efficiency of service delivery would have improved due to better metering, billing and collection that would buttress the larger price increases. It is useful to note that the above two actions, on pricing and reduction of commercial losses, are pre-requisites for eliciting private sector interest, and will go a long way in reducing the huge quasi-fiscal deficit.

91. Regarding private sector participation, it is important that the Government recognizes the difficult internal environment (see the discussion on Enterprises and Private Sector Development) as well as the dwindling interests of western investors in developing country energy assets globally, and therefore be realistic in its expectations about private investments. The Government should offer majority stakes in strategic sales to investors. In addition, the Government should consider alternative approaches to private sector participation, such as: (a) concessions, where the assets are turned over to a private concessionaire, who will have responsibility for investments; (b) joint ventures with the state where the private investor has the majority and management control; (c) franchise models, where a foreign operator/manager takes over the operation of an asset with a small equity stake; and (d) performance-oriented management contracts.

92. Efforts to attract private sector in energy should also follow a phased approach. In the first phase, they could be focused on (a) upstream oil and the oil services sector, because investor interest is highest in development of existing oil reserves and further exploration; and (b) refined product and LPG distribution and marketing, since this segment of the sector is easiest to privatize including to local SMEs. Private sector participation in refineries, parts of the upstream gas sector, gas distribution, and electricity distribution and generation should all be part of a *second phase*, since private sector participation in such assets and businesses requires significantly more preparation in terms of legal, regulatory, and organizational changes.

93. Preparation of the more complex segments, such as electricity and gas transmission distribution, for private sector participation requires establishing an appropriate industry structure for both gas and electricity, as well as an acceptable legal and regulatory regime. Work is already underway for the oil and gas sector (except gas distribution) and is being planned for the electricity sector. As regards legal framework, the Government should enact key legislation in the energy sector together with supporting regulations. This should include a Petroleum Law during the first phase and an Electricity Law during the second phase. In addition, a single strong and independent regulatory body for the entire energy sector should be established. In the first phase, the two existing technical regulatory bodies (one each for oil and gas and for

electricity) should be merged, given authority to regulate prices (which is currently with the Ministry of Finance) and work initiated to build regulatory capacity to strengthen this body and provide the legal basis to make it independent. The implementation of the strengthening and independence measures would happen during the second phase.

94. Finally, the Government should realize that reform of the energy sector is a time consuming process. The first phase, which would take up to two years, would comprise critical actions such as complete liberalization of petroleum and coal prices, initiation of modest but real tariff increases for gas and electricity, implementing social protection mechanism(s) for the poor, implementing measures to enhance financial discipline, privatization of upstream oil, oil services, and retail operations of petroleum and LPG, initiation of the industry structure for oil and gas, passage of a petroleum law, and initiation of the creation of an independent regulatory body. The second phase would require another 3 years, and would comprise more aggressive tariff adjustments for gas and electricity, completion of the revision of the industry structure, passage of an electricity law, and private sector participation in the remaining parts of the oil and gas sector, and implementation of the regulatory framework. This phase would also include initiation of private sector participation in the electricity and gas distribution sectors.

95. Experience elsewhere shows that, as soon as there is demonstrated commitment to address the pricing issues and financial discipline issues, i.e., say at the end of the first phase, private investors would start showing interest in the sector. Therefore, the government should be in a position to realize some private investments during the second phase, if necessary using contract based regulations (such as concessions) while the regulatory capacity is still being developed. However, the bulk of the private investments would come in a third phase, assuming of course the reform momentum is sustained during the first five years (i.e., the first and second phase). During this third phase, fine-tuning of the regulatory framework and legal framework, as necessary would also be implemented.

96. The proposed reform actions, sequenced in the three phases, are provided in Annex 5. One overarching policy change (it is more of a mindset change) required is the transparency and availability of data and information regarding the sector, its resources, its past operations, and the government's real plans/objectives for the sector. Several attempts from the Bank and other multilateral institutions to obtain the data for analysis and assessment continues to be unfulfilled. Similar attempts by consultants and advisors (for example the BNPP-led Advisory consortium for the reform and privatization of UNG), also leave a lot to be desired, leading to waste of resources (consulting fees), time and consequently missed opportunities for attracting private investments. When seeking private and/or international investments, the data and information should be especially forthcoming and verifiable by the recipients. **The importance of this aspect of 'reform' can never be overstated. Therefore, the first item of reform that the government should undertake is to issue a decree to instruct all stakeholders, particularly those in the Government, Government organizations and SOEs, to share whatever data and information needed by international organizations (World Bank included) and consultants hired by the government for the specific purpose of assisting in sector reform, freely and without any restrictions whatever.**

## Annex 1: Foreign Borrowing in the Uzbekistan Energy Sector

| No.                  | Creditor   | Description  | Guarantor        | Currency of the loan | Total credit amount, Million |                |
|----------------------|--|--|------------------|----------------------|------------------------------|----------------|
|                      |  |  |                  |                      | Original currency            | USD equivalent |
| <b>UzbekNefteGaz</b> |  |  |                  |                      |                              |                |
| 1                    | Turkeximbank                                       | Purchases of 550 oil-delivery trucks   | Uzbek Government | EUR                  | 18.4                         | 16.1<br>1.1    |
| 2                    | DISmerzbank (Germany)                              | Construction of the Shurtan polyethylene production complex                        | Uzbek Government | EUR                  | 39.2                         | 35             |
| 3                    | EBRD   | Reconstruction of the Fergana Refinery   | Uzbek Government | USD                  | 90                           | 90             |
| 4                    | Morgan Trust DISpany                               | Kokdumalak Oil and Condensate Field Development                                    | Uzbek Government | USD                  | 53.1                         | 53.1           |
| 5                    | Chemical Bank (USA)                                | Construction of the Bukhara Refinery   | Uzbek Government | USD                  | 35.7                         | 35.7           |
| 6                    | Chase Manhattan Bank (USA)                         | Construction of the Hajiabad Underground Natural Gas Storage                       | Uzbek Government | USD                  | 61.7                         | 61.7           |
| 7                    | Chase Manhattan Bank (USA)                         | Construction of the Shurtan polyethylene production complex                        | Uzbek Government | USD                  | 214.4                        | 214.4          |
| 8                    | Chase Manhattan Bank (USA)                         | Construction of the Shurtan polyethylene production complex                        | Uzbek Government | USD                  | 36.5                         | 36.5           |
| 9                    | ABN-Amro Bank New York                             | Construction of the compressor station for Shurtan polyethylene production complex | Uzbek Government | USD                  | 102.9                        | 102.9          |
| 10                   | ABN-Amro Bank New York                             | Construction of the compressor station for Shurtan polyethylene production complex | Uzbek Government | USD                  | 49.5                         | 49.5           |
| 11                   | Bank Hapoalim B.M. (Israel)                        | Construction of the compressor station for Shurtan polyethylene production complex | Uzbek Government | USD                  | 42.8                         | 42.8           |
| 12                   | Eximbank of Japan                                  | Kokdumalak Oil and Condensate Field Development                                    | Uzbek Government | JPY                  | 8,910.00                     | 82.5           |
| 13                   | Eximbank of Japan                                  | Construction of the Bukhara Refinery   | Uzbek Government | JPY                  | 6,919.00                     | 63.5           |
| 14                   | Eximbank of Japan                                  | Reconstruction of the Fergana Refinery   | Uzbek Government | JPY                  | 9,715.00                     | 86             |
| 15                   | Eximbank of Japan                                  | Construction of the Shurtan polyethylene production complex                        | Uzbek Government | JPY                  | 41,258.20                    | 358.8          |
| 16                   | CCF (Credit DISmercial de France) / Banque Paribas | Construction of the Bukhara Refinery   | Uzbek Government | FRF                  | 494.5                        | 70.6           |
| <b>Total:</b>        |  |  |                  |                      |                              | <b>1,400.2</b> |

| <b>SJSC UzbekEnergо</b> |                 |  |                  |     |           |                |
|-------------------------|-----------------|--|------------------|-----|-----------|----------------|
| 1                       | EBRD            | Reconstruction of the Syrdaria TPP                                   | Uzbek Government | USD | 27.8      | 27.8           |
| 2                       | Ansol Ltd. (UK) | Construction of the Block #1 of the Talimarjan TPP and "Sogdiana" SS | Uzbek Government | USD | 59.3      | 59.3           |
| 3                       | JBIC (Japan)    | Tashkent Thermal Rower Plant modernization project                   | Uzbek Government | JPY | 24,955.00 | 204.5          |
| 4                       | ADB             | Regional power modernization project                                 | Uzbek Government | USD | 70.0      | 70.0           |
| 5                       | EBRD            | Regional power modernization project                                 | Uzbek Government | USD | 49.0      | 49.0           |
| <b>Total:</b>           |                 |  |                  |     |           | <b>410.6</b>   |
| <b>SJSC UzbekUgol</b>   |                 |  |                  |     |           |                |
| 1                       | Berliner Bank   | Technical Re-equipment of the Uzbek Coal Sector                      | Uzbek Government | EUR | 21.5      | 19.5           |
| <b>Total:</b>           |                 |  |                  |     |           | <b>19.5</b>    |
| <b>Grand Total:</b>     |                 |  |                  |     |           | <b>1,830.3</b> |

## Annex 2: Computation of 2002 Quasi Fiscal Deficit in Uzbekistan Energy Sector

The QFD in Energy Sector is caused by (a) mis-pricing of energy commodity relative to their economic cost, (b) operational inefficiency, and (c) commercial inefficiencies.

- Economic cost of energy commodities such as electricity and gas, in the LRMC of supply of such commodities to the end consumer, due to the economic objectives of these sectors in economic self-efficiency and these have minimal foreign sale. On the other hand, for commodities such as crude oil and coal, the economic price is the export-parity price since these are traded widely.
- As regards operational inefficiency these can be split up into: technical losses (losses in the networks), unbilled losses and commercial losses (non-payments).<sup>1</sup>

The QFD computations are carried out for major commodities, such as electricity, gas, and crude oil in order to get a sense of the magnitude of the QFD. However, mis-pricing of other commodities, i.e. coal, heat, petroleum products, also contribute to the QFD. Accordingly, the QFD computed here is a conservative estimate.

### Electricity.

#### Production and Consumption Data in 2002

| Indicators  | Unit | Quantity |
|---|------|----------|
| Gross (Power Generation plus Import minus Export) | GWh  | 49,214   |
| Consumption                                       |      |          |
| Net (billed) Consumption                          | GWh  | 38,112   |
| Losses  | GWh  | 11,102   |
| Losses as % of Gross Consumption                  | %    | 22.6     |

#### Economic Costs and Actual Pricing Data in 2002

| Indicators                        | Unit    | Quantity          |
|-----------------------------------|---------|-------------------|
| LRMC of Supply <sup>2</sup>       | USc/kWh | 3.50 <sup>3</sup> |
| Actual Pricing (weighted average) | USc/kWh | 0.845             |

### QFD

| QFD clause                                   | Calculation                      | Quantity          |
|--|----------------------------------|-------------------|
| Due to mis-pricing                           | $38,112 * (0.035 - 0.00845)$     | US\$1,012 million |
| Due to technical inefficiencies <sup>4</sup> | $49,214 * (0.226 - 0.1) * 0.035$ | US\$216 million   |

<sup>1</sup> Unbilled losses generally include losses arising due to lack of meters. Unmetered supplies are usually billed on the basis of norms; and the consumers routinely consume more than the norms, which gives rise to unbilled consumption. In this instance, such unbilled supplies are part of "technical" losses.

<sup>2</sup> Includes costs of generation, transmission, distribution, and supply

<sup>3</sup> Fichtner of Germany, working as Consultant to ADB, estimates this to be USc 4.03/kWh. At this level the QFD due to mis-pricing would be US\$1,303.5 million

|   |                            |                   |
|---|----------------------------|-------------------|
| Due to commercial inefficiencies <sup>5</sup> | 38,112*0.00845*(0.25-0.02) | US\$74 million    |
| Total QFD in Electricity Sector               |                            | US\$1,302 million |

### Gas sector.

#### Production and Consumption Data in 2002

| Indicators                     | Unit | Quantity |
|--------------------------------|------|----------|
| Total Gas Produced             | BCM  | 57.7     |
| Exported                       | BCM  | 5.6      |
| Transmission Technical Losses  | BCM  | 12.6     |
| Gas supplied in country        | BCM  | 39.5     |
| Gas billed in country          | BCM  | 38.1     |
| Distribution Technical Losses  | BCM  | 1.4      |
| Total Technical Losse          | BCM  | 14.0     |
| Losses as % of Domestic Supply | %    | 26.8     |

#### Consumption Structure in 2002

| Indicators                           | Unit | Quantity | %     |
|--------------------------------------|------|----------|-------|
| Gas Supplied to BoshKommunGas        | BCM  | 22.4     | 57    |
| Including Gas Supplied to population | BCM  | 17.6     | 45    |
| Gas Supplied to Power Plants (UE)    | BCM  | 11.5     | 29    |
| Gas Supplied to other industries     | BCM  | 5.6      | 14    |
| Total                                | BCM  | 39.5     | 100.0 |

#### Economic Costs and Actual Pricing Data in 2002

| Indicators                        | Unit     | Quantity        |
|-----------------------------------|----------|-----------------|
| LRMC of Supply                    | US\$/KCM | 15 <sup>6</sup> |
| Actual Pricing (weighted average) | US\$/KCM | 7.8             |
| QFD/Unit of gas sold              | US\$/KCM | 7.2             |

### QFD

- Since the LRMC of electricity already assumes gas to power production is priced at economic costs, the relevant quantity for calculating QFD due to mis-pricing is 71% of total gas sales billed in the country.
- Non-payment is pervasive throughout the gas sector and is legally sanctioned. A 50% non-payment rate is assumed throughout the Sector.

<sup>4</sup> Normative (reasonable) electricity technical losses assumed at 10%

<sup>5</sup> 2002 non-payment rate for electricity is not available at the moment and the level of non-payments is estimated at 25%, approximately at the same level as in 2001. Normative (reasonable) electricity non-payments assumed at 2%

<sup>6</sup> Sofregan of France has estimated this to be US\$25/KCM. At this level of LRMC, the QFD in gas due to mis-pricing would be US\$548 million

| QFD clause                                    | Calculation                  | Quantity        |
|---|------------------------------|-----------------|
| Due to mis-pricing                            | $0.7 * 38.1 * (15 - 7.8)$    | US\$191 million |
| Due to technical inefficiencies <sup>7</sup>  | $52.0 * (0.268 - 0.02) * 15$ | US\$193 million |
| Due to commercial inefficiencies <sup>8</sup> | $38.1 * (0.5 - 0.02) * 7.8$  | US\$143 million |
| Total QFD in Gas Sector                       |                              | US\$527 million |

### Crude Oil.

Uzbekistan incurs opportunity cost due to selling crude oil in the domestic market (to refinery) at prices that are below international export parity levels. This opportunity cost can be turned as quasi fiscal activities (QFA) in the energy sector.

#### *Production and Consumption Data in 2002*

| Indicators  | Unit          | Quantity |
|---|---------------|----------|
| Production of Liquid Hydrocarbon (Crude Oil and Gas Condensate) | million tones | 7.2      |
| Liquid Hydrocarbon Supplied to Refineries                       | million tones | 6.1      |

#### *Economic Costs and Actual Pricing Data in 2002*

| Indicators                       | Unit     | Quantity |
|----------------------------------|----------|----------|
| Export Parity Price of Crude oil | US\$/ton | 82.00    |
| Actual Price to Refineries       | US\$/ton | 20.09    |

#### *QFA*

| QFA clause         | Calculation             | Quantity        |
|--------------------|-------------------------|-----------------|
| Due to mis-pricing | $6.1 * (82.00 - 20.09)$ | US\$381 million |

<sup>7</sup> Normative (reasonable) gas technical losses and non-payments assumed at 2%.

<sup>8</sup> 2002 non-payment rate for natural gas is not available at the moment and level of the non-payments is estimated at approximately the same level as in 2001.

### Annex 3: August 2001 – June 2003 Energy Tariffs Evolution

|                          | 2001       |             | 2002       |             |            |             | 2003       |             |            |             |            |             |            |             |
|--------------------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|
|                          | Jul. 1     |             | Apr. 1     |             | Aug. 1     |             | Dec. 1     |             | Feb. 1     |             | Apr. 1     |             | Jun. 1     |             |
| <b>Electric Power</b>    | Soum/kWh   | UScents/kWh | Soum/kWh   | UScents/kWh | Soum/kWh   | UScents/kWh | Soum/kWh   | UScents/kWh | Soum/kWh   | UScents/kWh | Soum/kWh   | UScents/kWh | Soum/kWh   | UScents/kWh |
| Wholesale                | 4.80       | 0.78        | 7.30       | 0.74        | 8.70       | 0.89        | 10.30      | 0.98        | 11.20      | 1.07        | 12.10      | 1.16        | 13.10      | 1.30        |
| Retail                   | 4.70       | 0.76        | 7.40       | 0.75        | 8.70       | 0.89        | 10.30      | 0.98        | 11.20      | 1.07        | 12.10      | 1.16        | 13.10      | 1.30        |
| Weighted Average Tariffs | 4.70       | 0.76        | 7.33       | 0.74        | 8.60       | 0.88        | 10.18      | 0.96        | 11.06      | 1.06        | 11.87      | 1.14        | 12.73      | 1.26        |
| <b>Coal</b>              | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    |
| Wholesale                | 6,750      | 10.92       | 11,197     | 11.30       | 11,474     | 11.75       | 11,750     | 11.13       | 15,200     | 14.56       | 18,300     | 17.58       | 18,300     | 18.18       |
| Retail                   | 3,500      | 5.66        | 2,925      | 2.95        | 2,998      | 3.07        | 3,070      | 2.91        | 4,040      | 3.87        | 5,650      | 5.43        | 5,650      | 5.61        |
| <b>Natural gas</b>       | Soum/KCM   | US\$/KCM    | Soum/KCM   | US\$/KCM    | Soum/KCM   | US\$/KCM    | Soum/KCM   | US\$/KCM    | Soum/KCM   | US\$/KCM    | Soum/KCM   | US\$/KCM    | Soum/KCM   | US\$/KCM    |
| Wholesale                | 7,140      | 11.55       | 10,400     | 10.49       | 12,000     | 12.29       | 13,800     | 13.07       | 15,000     | 14.36       | 16,300     | 15.65       | 17,700     | 17.58       |
| Retail                   | 3,333      | 5.39        | 5,133      | 5.18        | 6,160      | 6.31        | 6,776      | 6.42        | 6,776      | 6.49        | 7,657      | 7.35        | 7,657      | 7.61        |
| Of which: for cooking    | 3,333      | 5.39        | 5,133      | 5.18        | 6,160      | 6.31        | 6,776      | 6.42        | 6,776      | 6.49        | 7,657      | 7.35        | 7,657      | 7.61        |
| for heating              | 1,545      | 2.50        | 2,380      | 2.40        | 2,856      | 2.92        | 3,142      | 2.98        | 3,142      | 3.01        | 3,550      | 3.41        | 3,550      | 3.53        |
| <b>Oil/Oil products</b>  | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    | Soum/ton   | US\$/ton    |
| Crude oil, Wholesale     | 16,000     | 25.88       | 19,200     | 19.37       | 19,200     | 19.66       | 19,200     | 18.18       | 21,500     | 20.59       | 21,500     | 20.65       | 21,500     | 21.36       |
| Oil products, Wholesale  |            |             |            |             |            |             |            |             |            |             |            |             |            |             |
| Gasoline (A-72, A-76)    | 195,000    | 315.40      | 195,000    | 196.73      | 227,500    | 232.92      | 227,500    | 215.43      | 227,500    | 217.86      | 227,500    | 218.49      | 227,500    | 225.99      |
| Gasoline (A-92, A-93)    | 240,500    | 388.99      | 234,000    | 236.07      | 273,000    | 279.50      | 273,000    | 258.52      | 273,000    | 261.44      | 273,000    | 262.19      | 273,000    | 271.19      |
| Diesel fuel              | 93,000     | 150.42      | 97,100     | 97.96       | 106,500    | 109.04      | 109,500    | 103.69      | 110,500    | 105.82      | 132,686    | 127.43      | 132,686    | 131.81      |
| Fuel oil (Wholesale)     | 13,900     | 22.48       | 18,180     | 18.34       | 20,080     | 20.56       | 20,400     | 19.32       | 20,400     | 19.54       | 20,400     | 19.59       | 20,400     | 20.27       |
| Oil products, Retail     | Soum/liter | US\$/liter  | Soum/liter | US\$/liter  | Soum/liter | US\$/liter  | Soum/liter | US\$/liter  | Soum/liter | US\$/liter  | Soum/liter | US\$/liter  | Soum/liter | US\$/liter  |
| Gasoline (A-72, A-76)    | 150        | 0.24        | 180        | 0.18        | 210        | 0.21        | 210        | 0.20        | 210        | 0.20        | 240        | 0.23        | 255        | 0.25        |
| Gasoline (A-92, A-93),   | 180        | 0.29        | 220        | 0.22        | 250        | 0.26        | 250        | 0.24        | 250        | 0.24        | 280        | 0.27        | 295        | 0.29        |
| Diesel fuel              | 150        | 0.24        | 180        | 0.18        | 210        | 0.21        | 210        | 0.20        | 210        | 0.20        | 240        | 0.23        | 255        | 0.25        |
| <b>Exchange Rates</b>    |            |             |            |             |            |             |            |             |            |             |            |             |            |             |
| OER                      | 388.08     |             | 695.38     |             | 761.25     |             | 920.02     |             | 960.38     |             | 968.69     |             | 971.10     |             |
| CER                      | 688.04     |             | 696.68     |             | 764.00     |             | 923.00     |             | 960.00     |             | 968.00     |             | 972.25     |             |
| Curb ER                  | 963.55     |             | 1435.00    |             | 1300.00    |             | 1260.00    |             | 1170.00    |             | 1150.00    |             | 1060.00    |             |
| Nominal Market ER*       | 618.27     |             | 991.23     |             | 976.75     |             | 1056.01    |             | 1044.23    |             | 1041.21    |             | 1006.66    |             |

#### Annex 4: Exports by Uzbekistan refineries in 1999 and 2000 (tons)

|                 | 1999           |                |                | 2000           |                |                |
|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                 | Fergana        | Bukhara        | Total          | Fergana        | Bukhara        | Total          |
| Russia          | 9 610          | 96 386         | <b>105 996</b> | 14 106         | 64 401         | <b>78 507</b>  |
| Ukraine         | 3 100          | 84 797         | <b>87 897</b>  | 27 873         | 11 669         | <b>39 542</b>  |
| Kazakhstan      | 77 435         | 5 590          | <b>83 025</b>  | 12 477         |                | <b>12 477</b>  |
| Tajikistan      | 154 977        | 80 628         | <b>235 605</b> | 115 191        | 9 721          | <b>124 912</b> |
| Kyrgyz Republic | 25 810         | 22 227         | <b>48 037</b>  | 84 355         | 25 736         | <b>110 091</b> |
| Georgia         | 1 000          | 9 204          | <b>10 204</b>  | 3 635          | 90 157         | <b>93 792</b>  |
| Turkmenistan    | 300            | 66 813         | <b>67 113</b>  | 5 115          | 7 618          | <b>12 733</b>  |
| Azerbaijan      |                |                | <b>0</b>       | 165            |                | <b>165</b>     |
| Latvia          | 6 000          |                | <b>6 000</b>   | 1 000          |                | <b>1 000</b>   |
| Lithuania       |                | 10 683         | <b>10 683</b>  | 39 220         |                | <b>39 220</b>  |
| Estonia         | 3 300          |                | <b>3 300</b>   |                |                | <b>0</b>       |
| Italy           |                |                | <b>0</b>       | 4 010          | 29 761         | <b>33 771</b>  |
| Poland          |                |                | <b>0</b>       | 765            |                | <b>765</b>     |
| Slovakia        |                |                | <b>0</b>       | 110            |                | <b>110</b>     |
| Turkey          |                | 26 071         | <b>26 071</b>  | 28 268         |                | <b>28 268</b>  |
| Iran            |                | 14 431         | <b>14 431</b>  | 1 250          | 10 487         | <b>11 737</b>  |
| China           |                |                | <b>0</b>       | 1 500          |                | <b>1 500</b>   |
| Switzerland     |                |                | <b>0</b>       |                | 1 691          | <b>1 691</b>   |
| Bahrain         |                |                | <b>0</b>       |                | 3 865          | <b>3 865</b>   |
| <b>Total</b>    | <b>281 532</b> | <b>416 830</b> | <b>698 362</b> | <b>339 040</b> | <b>255 106</b> | <b>594 146</b> |

#### Export prices for Gasoline, Diesel, Lubes and Coke for year 2000

|                 | Gasoline      |               | Diesel         |                 | Lubes           |                 | Coke          |            |
|-----------------|---------------|---------------|----------------|-----------------|-----------------|-----------------|---------------|------------|
|                 | Tons          | Kilo Sums     | Tons           | Kilo Sums       | Tons            | Kilo Sums       | Tons          | Kilo Sums  |
| Russia          | 0             | 0             | 77 646         | 8 332           | 718,3           | 109,5           | 0             | 0          |
| Ukraine         | 0             | 0             | 32 860         | 4 250           | 5573            | 725,6           | 0             | 0          |
| Latvia          | 0             | 0             | 0              | 0               | 999,1           | 55              | 0             | 0          |
| Lithuania       | 0             | 0             | 0              | 0               | 167,4           | 19,8            | 0             | 0          |
| Georgia         | 8 248         | 1 727         | 52 089         | 6 496           | 548,7           | 88,5            | 0             | 0          |
| Azerbaijan      | 0             | 0             | 0              | 0               | 164,7           | 27,4            | 0             | 0          |
| Kazakhstan      | 0             | 0             | 6 454          | 835,4           | 5021            | 753,6           | 0             | 0          |
| Tajikistan      | 19 153        | 4 168         | 92 573         | 12 969          | 1367            | 196             | 7 727         | 335        |
| Turkmenistan    | 11 654        | 2 581         | 0              | 0               | 975,8           | 123,9           | 0             | 0          |
| Kyrgyz Republic | 35 071        | 7 445         | 30 645         | 4 800           | 462,2           | 79,8            | 0             | 0          |
| Italy           | 0             | 0             | 33 629         | 3 915           | 0               | 0               | 0             | 0          |
| Switzerland     | 0             | 0             | 1 691          | 169,1           | 0               | 0               | 0             | 0          |
| Poland          | 0             | 0             | 0              | 0               | 763,2           | 100,6           | 0             | 0          |
| Slovakia        | 0             | 0             | 0              | 0               | 106,1           | 20,4            | 0             | 0          |
| Turkey          | 0             | 0             | 1 490          | 180,4           | 26 768          | 26 768          | 3 839         | 0          |
| Iran            | 0             | 0             | 7 267          | 726,7           | 1 250           | 191,3           | 0             | 0          |
| China           | 0             | 0             | 0              | 0               | 1 487           | 157,7           | 0             | 0          |
| <b>Total</b>    | <b>74 126</b> | <b>15 921</b> | <b>336 344</b> | <b>42 673,6</b> | <b>46 371,5</b> | <b>29 417,1</b> | <b>11 566</b> | <b>335</b> |

**Export prices for Fuel Oil, Paraffin Oil, Furnace Fuel Oil, and other oil products in 2000**

|                 | Fuel oil        |                | Paraffin oil  |              | Furnace fuel    |                | Other        |              |
|-----------------|-----------------|----------------|---------------|--------------|-----------------|----------------|--------------|--------------|
|                 | Tons            | Kilo Sums      | Tons          | Kilo Sums    | Tons            | Kilo Sums      | Tons         | Kilo Sums    |
| Russia          | 0               | 0              | 0             | 0            | 0               | 0              | 142,5        | 19,2         |
| Ukraine         | 0               | 0              | 0             | 0            | 972,9           | 108,4          | 0            | 0            |
| Lithuania       | 0               | 0              | 39 049        | 4 352        | 0               | 0              | 0            | 0            |
| Georgia         | 32 905          | 1 612          | 0             | 0            | 0               | 0              | 0            | 0            |
| Kazakhstan      | 982             | 37,3           | 0             | 0            | 0               | 0              | 0            | 0            |
| Tajikistan      | 331,1           | 14,4           | 0             | 0            | 0               | 0              | 3 837        | 490,8        |
| Kyrgyz Republic | 29 477          | 1 562          | 0             | 0            | 10 554          | 1 080          | 3807         | 365,9        |
| Bahrain         | 3865            | 189,4          | 0             | 0            | 0               | 0              | 0            | 0            |
| Iran            | 3220            | 157,8          | 0             | 0            | 0               | 0              | 0            | 0            |
| <b>Total</b>    | <b>70 780,1</b> | <b>3 572,9</b> | <b>39 049</b> | <b>4 352</b> | <b>11 526,9</b> | <b>1 188,4</b> | <b>7 787</b> | <b>875,9</b> |

### Annex 5: Energy Sector Reform

| Objective   | Current Status   | Phase I  | Phase II  | Phase III   |
|---|--|--|---|---|
| <p><i>Reduction of Quasi Fiscal Deficits and achievement of financial viability of the sector in a socially sustainable way</i></p>     | <p>Due to low energy prices, lack of financial discipline and operational inefficiencies, the quasi-fiscal deficit in the energy sector is estimated at about \$2.4 bn.</p> <p>Energy sector enterprises engage in offsetting and barter schemes, and are prohibited from disconnecting certain strategic enterprises for non-payments.</p>  | <p>Liberalize petroleum and coal prices.</p> <p>Initiate modest but real increases in electricity, gas and heat tariffs</p> <p>Implement Social Protection mechanism(s) for the poor</p> <p><b>Implement measures to enhance financial discipline including proper metering and removing SOEs' legal rights to accumulate arrears.</b></p>                         | <p>Complete pricing adjustments through aggressive price increases for electricity gas and heat.</p> <p>Ensure the effectiveness of social protection mechanism.</p>  |   |
| <p><i>Creation of the appropriate environment for the efficient operation and private sector participation of the energy sector</i></p> | <p>The current industry structure, in oil and gas and in electricity is still quite monopolistic and is not conducive to for private sector participation. The monopolistic segments, such as gas and electricity transmission, and the utility service segments, such as electricity and gas distribution need to have appropriate legal and regulatory framework.</p>  | <p>Complete the restructuring of the Oil and Gas sector</p> <p>Initiate the work to establish the appropriate industry structure for electricity</p> <p>Adopt Petroleum Law</p> <p>Merge the oil and gas and electricity regulatory (technical) and give them authority to regulate pricing</p>  | <p>Complete restructuring of the electricity sector</p> <p>Adopt Electricity Law</p> <p>Build regulatory capacity and implement measures to make it independent</p>   | <p>Fine-tune the regulatory, and if necessary the legal framework</p> |
| <p><i>Mobilization of private investments for hydrocarbon reserves replacement and arrest deterioration of infrastructure</i></p>       | <p>Although privatization is the route chosen by the government to mobilize investments, the government is seeking private investments: (a) without the appropriate prior actions (on pricing, industry structure, legal and regulatory framework); (b) in a difficult internal and external investment environment; and (c) by offering only minority stakes in selected enterprises. These efforts are highly unlikely to succeed.</p> | <p>Adopt privatization policy to: (a) offer majority stakes in strategic sales; and (b) consider alternative approaches such as concessions, to realize private sector participation.</p> <p>Initiate private sector participation in: (a) hydrocarbon exploration and production; (b) oil field services; (c) retail petroleum operations and LPG businesses.</p> | <p>Initiate private sector participation in refineries, electricity generation and distribution, and gas transmission and distribution.</p> <p>Realize as much private participation as possible using contract-based regulation as necessary</p> | <p>Complete private sector participation in energy sector</p>         |