

**REPORT AND RECOMMENDATION
OF THE
PRESIDENT
TO THE
BOARD OF DIRECTORS
ON A
PROPOSED LOAN
TO THE
TRANSITIONAL ISLAMIC STATE OF AFGHANISTAN
FOR THE
EMERGENCY INFRASTRUCTURE REHABILITATION AND
RECONSTRUCTION PROJECT**

May 2003

CURRENCY EQUIVALENTS

(as of 30 April 2003)

Currency Unit	–	Afghani (AF)
AF1.00	=	\$0.01923
\$1.00	=	AF52.00

ABBREVIATIONS

AACA	–	Afghan Assistance Coordination Authority
ADB	–	Asian Development Bank
ADF	–	Asian Development Fund
CG	–	consultative group
CNA	–	comprehensive needs assessment
CSPU	–	Country Strategy and Program Update
DABM	–	Da Afghanistan Brishna Moassesa
EA	–	executing agency
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
IA	–	implementing agency
IEE	–	initial environmental examination
IG	–	implementation group
JICA	–	Japan International Cooperation Agency
KfW	–	Kreditanstalt für Wiederaufbau
MOF	–	Ministry of Finance
MPW	–	Ministry of Public Works
MWP	–	Ministry of Water and Power
NDB	–	national development budget
NPV	–	net present value
O&M	–	operation and maintenance
PCU	–	project coordination unit
PIU	–	project implementation unit
PMPL	–	Postconflict Multisector Program Loan
PNA	–	preliminary needs assessment
PPMS	–	project performance monitoring system
RP	–	resettlement plan
Sida	–	Swedish International Development Agency
SSF	–	social screening framework
TA	–	technical assistance
TAC	–	technical assistance cluster
USAID	–	United States Agency for International Development
VOCs	–	vehicle operating costs
WFP	–	World Food Program

NOTES

- (i) The fiscal year (FY) of the Transitional Islamic State of Afghanistan ends on 21 March. FY before a calendar year denotes the year in which the fiscal year ends (e.g., FY2003 ends on 21 March 2003).
- (ii) In this report, "\$" refers to US dollars.

This report was prepared by a team consisting of: H. Masood (team leader/project specialist), Chong Chi Nai (sr. energy specialist), N. Jung (sr. energy specialist), M. Elerud (energy sector specialist), S. Handayani (social development specialist), D. Utami (environment specialist), M. Fujimura (economist/program officer), and A. Qadir (counsel).

CONTENTS

	Page
LOAN AND PROJECT SUMMARY	i
MAP	v
I. THE PROPOSAL	1
II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES	1
A. Rehabilitation/Reconstruction	1
B. Analysis of Key Problems and Opportunities	1
C. Social Dimension and Impact on Poverty	4
D. External Assistance and Aid Coordination	4
E. Afghanistan's National Development Framework and Budget	5
F. ADB's Country Strategy and Program Update	5
G. Lessons Learned	6
III. THE PROPOSED PROJECT	6
A. Objectives	6
B. Components and Output	7
C. Cost Estimates	8
D. Financing Plan	8
E. Special Loan Terms	9
F. Implementation Arrangements	9
G. Environmental and Social Measures	12
IV. PROJECT BENEFITS, IMPACTS AND RISKS	13
A. Impact on Poverty and Other Benefits	13
B. Economic and Financial Assessment	14
C. Project Sustainability	16
D. Environmental Impact	17
E. Risks	17
V. ASSURANCES	18
A. Specific Assurances	18
B. Condition for Loan Effectiveness	20
VI. RECOMMENDATION	20
APPENDIXES	
1. Project Framework	21
2. External Assistance	23
3. Road Infrastructure	25
4. Power Infrastructure	29
5. Gas Infrastructure	34
6. Summary of Cost Estimate	39
7. Implementation Arrangements	40
8. Implementation Schedule	41
9. Contract Packages	43
10. Social Screening Framework	44

11. Summary Poverty Reduction and Social Development Strategy	46
12. Economic Analysis	49
13. Financial Analysis	52
14. Summary Initial Environmental Examination	56

SUPPLEMENTARY APPENDIXES (available on request)

- A. Human Development Indicators, Poverty Lines, and Poverty Indicators by Province
- B. Comprehensive Needs Assessment for Transport Sector

LOAN AND PROJECT SUMMARY

Borrower	Transitional Islamic State of Afghanistan
Classification	Poverty Classification: Poverty intervention Thematic Classification: Economic growth
Environment Assessment	Category B
Project Description	The Project will rehabilitate and reconstruct (i) 447 kilometers (km) of the primary national road network, including the link to Uzbekistan; (ii) power transmission lines in the northern provinces and the distribution system in Kabul; and (iii) damaged gas production, transmission, and distribution facilities in Sheberghan, including the natural gas pipeline to Mazar Sharif.
Rationale	Most of the infrastructure in Afghanistan is destroyed or damaged due to two decades of war. Lack of resources and of capacity prevented maintenance, which led to major deterioration and in some cases loss of infrastructure. This is particularly true for major national roads, power and natural gas facilities. Revival of the economy of Afghanistan and resumption of growth depends critically on reconstruction and rehabilitation of this key infrastructure, which could contribute to employment creation, income generation at the household level, rehabilitation of displaced populations and excombatants, improvement of security and stability, interethnic reconciliation, and political unification of the country. The Project will contribute to reviving the economic activities across the country, thereby providing employment and reducing poverty.
Objectives and Scope	<p>The main objective of the Project is to help the Islamic Transitional Government of Afghanistan (Government) restore key infrastructure in the transport (roads) and energy (power and gas) sectors. The Project will have the following parts:</p> <p>Part A: Road Infrastructure: urgently needed repair and rehabilitation of the Pule Khumri – Mazar Sharif – Sheberghan – Andkhoy section of the ring road (392 km), including the link to Uzbekistan (Naibabad – Hairatan road, 55 km)</p> <p>Part B: Power Infrastructure: (i) rehabilitation and reconstruction of 230 circuit-kilometers (cct-km) of 220 kilovolt (kV) and 50 cct-km of 110 kV transmission lines; (ii) reconstruction of Khulum and Pule Khumri 220/110 kV substations; (iii) reconstruction of distribution substations, junctions, transformers, equipment, cables, and material; (iv) electricity service delivery including installation of 30,000 meters and utilization of low voltage aerial bundled conductors; (v) load dispatch center for Kabul; (vi) improved billing, revenue collection, and computerization; and (vii) development of geographic information, asset management, and customer management systems</p>

Part C: Gas Infrastructure: urgently needed repairs and rehabilitation of (i) 12 gas wells, (ii) gas processing plant, (iii) two containerized gas production testing laboratories, (iv) corroded gas transmission and distribution lines including city gate stations, and (v) cathodic protection system

Cost Estimates The cost of the Project is estimated as \$150 million equivalent.

Financing Plan (\$ million)

Component	Foreign Exchange	Local Currency	Total Cost	ADB Financing
Part A: Road Infrastructure	66.85	15.82	82.67	100%
Part B: Power Infrastructure	29.50	3.57	33.07	100%
Part C: Gas Infrastructure	19.98	2.18	22.16	100%
Interest During Grace Period	10.18	1.92	12.10	100%
Total:	126.51	23.49	150.0	100%

Loan Amount and Terms A loan in various currencies equivalent to One Hundred and Ten million and Eighteen Thousand Special Drawing Rights (SDR110,018,000) (\$150 million equivalent) will be provided from ADB's Special Funds resources with a term of 40 years, including a grace period of 10 years, and an interest charge at the rate of 1% per annum. In addition, the total amount of the interest charge during the grace period will be capitalized and charged to the loan account.

Period of Utilization Until June 2013

Estimated Project Completion Date 30 June 2006

Executing Agencies The Ministry of Finance (MOF) will be the Executing Agency (EA). The implementing agencies (IAs) are the Ministry of Public Works for the roads infrastructure component; the Ministry of Water and Power for the power infrastructure component; and the Ministry of Mines and Industries for the gas infrastructure component.

Implementation Arrangements A project coordination unit will be established within MOF to monitor project implementation and coordinate with the IAs. MOF will appoint a project coordinator and assign appropriate staff to assist in overseeing project activities. Overall a project steering committee (PSC), chaired by the deputy minister of finance, will provide guidance and approvals. The PSC will consist of the ministers of IAs and will meet at least quarterly to review project implementation and to resolve, among others, interministerial coordination issues. The project coordinator will also serve as the secretary to PSC.

Procurement Procurement of goods, services and civil works to be financed under the Project will be carried out in accordance with the Asian Development Bank's (ADB) *Guidelines for Procurement*, with flexible interpretation, wherever essential, as provided under emergency assistance projects. All

international procurements, including other major procurements, will be undertaken by the Procurement Unit of the Afghanistan Assistance Coordination Authority, under MOF, with assistance from the international procurement advisor. Advance actions have been approved for procurement of consulting services, civil work contracts under the road infrastructure component, and turnkey contracts under the power and gas infrastructure components.

Consulting Services

Consulting services (280 person-months international and 500 person-months domestic) will be required to assist the EA and IAs in project implementation. All consultants financed under the project will be selected and engaged in accordance with ADB's *Guidelines on the Use of Consultants* with the flexibility, wherever essential, provided under emergency assistance projects.

Project Benefits and Beneficiaries

The road, power, and gas infrastructure components of the Project will benefit approximately 9 million people in seven provinces (Baghlan, Balkh, Faryab Jowzjan Kabul, Parvan, and Samangan) in which about 45% are living below \$0.25 per capita income per day. The proportion below the \$1 level would be much higher. The direct and indirect impact of the Project will be pro-poor, since the poor will benefit through employment generation and increased household income. While the Project will generate short-term employment during the construction period, operation and maintenance of facilities rehabilitated under the Project will generate permanent employment. Additional long-term employment will be generated from increased production, trade, transport, and services attributable to improved roads, power, and gas supply. There will be both direct employment impact as well as impact through interindustry linkages.

Risks and Assumptions

(i) The overall political and security situation remains volatile. ADB will continue to closely monitor and coordinate with local and central authorities and the United Nation (UN) agencies to ensure adequate protection. (ii) Undue delays in implementation of key activities are possible due to the Government's weak implementation capacity. Project consultants as well as consultants working under the ongoing technical assistance cluster for capacity building will assist the EA and IAs in implementation. (iii) Counterpart resources may be inadequate. ADB will work closely with MOF and IAs to ensure adequate allocation of resources. (iv) Roads may deteriorate due to overloading and lack of maintenance. ADB will encourage the Government to make appropriate budgetary resources from the Postconflict Multisector Program Loan for controlling vehicle overloading and carrying out road maintenance.

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Transitional Islamic State of Afghanistan for the Emergency Infrastructure Rehabilitation and Reconstruction Project.¹

II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES

A. Rehabilitation/Reconstruction

2. Much of the infrastructure in Afghanistan has been destroyed or damaged by two decades of war. Lack of resources and capacity prevented maintenance, leading to major deterioration and loss of infrastructure. Revival of the economy depends critically on reconstruction and rehabilitation of key infrastructure including roads, electric power, and natural gas facilities. Such rehabilitation and reconstruction would also contribute towards employment creation, income generation at the household level, rehabilitation of displaced populations and excombatants, improvement of security and stability, interethnic reconciliation, and political unification of the country. Given the strong political support for this process, and pledges for assistance expressed by the international community, it is critical to urgently commence rehabilitation and reconstruction of vital infrastructure.

B. Analysis of Key Problems and Opportunities

3. During December 2001, the Asian Development Bank (ADB), the United Nations Development Programme, and the World Bank undertook a preliminary needs assessment (PNA), which outlined strategic choices for reconstruction and development, presented the aid community with indicative funding requirements, and identified initial priorities supported by cost estimates. The PNA covered immediate needs, short-term options, and long-term development initiatives. The PNA report was presented at the Ministerial Meeting of the Steering Committee held in Tokyo in January 2002, where the funding agencies pledged assistance of approximately \$4.5 billion. The meeting also endorsed undertaking of comprehensive needs assessments (CNAs) for each sector. Multi-agency missions were mobilized subsequently, and detailed CNA reports² were prepared based on field surveys and discussions with the relevant agencies of the Islamic Transitional Government of Afghanistan. The CNA reports provided the initial database for the funding agencies to develop assistance programs in specific sectors.

4. **Need to Rehabilitate the Primary Road System.** Afghanistan is a landlocked country. With a large area (of about 652,000 square kilometers) and a population of 26 million widely spread across the largely mountainous terrain, roads are the principal means of transport for internal and international traffic. Aside from facilitating urgent humanitarian aid and returning refugees, roads are critical for economic revival and development. The road network comprises of about 6,000 kilometers (km) of national roads, of which 3,300 km are primary roads including 2,400 km roads that were originally paved. The national primary road network consists largely of the 2,227 km ring road (Kabul – Mazar Sharif – Sheberghan – Maymana – Herat – Kandahar – Kabul) and links to neighboring countries totaling about 800 km.³ The 615 km Sheberghan – Maymana – Herat section of the ring road is only partly constructed and is generally unpaved. The secondary and tertiary roads network of about 15,000 km consists of either gravel or

¹ See Project Framework in Appendix 1.

² ADB took the lead in preparation of CNA reports for agriculture, environment, education, and transport in 2002 and contributed to the CNA for the energy sector.

³ The international links are to Iran, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.

earthen roads. These roads have not yet been systematically surveyed, though it appears that they are generally in poor condition. The recorded traffic during the preconflict period on the primary network varied between 250 and 1,000 vehicles per day. Recent traffic surveys indicate that the traffic levels have grown fast and have significantly exceeded these figures. However, the road conditions have further deteriorated due to lack of rehabilitation and maintenance. To keep up with increasing traffic volume, promote trade links with neighboring countries, and improve movement of goods and services, thereby fostering trade and commerce, it is essential that the entire primary road network be rehabilitated on a priority basis. This is also supported by the findings of CNA report for the transport sector.

5. The Government has declared that reconstruction and rehabilitation of the road network, especially of national primary roads, is the country's top priority. Improved roads will not only facilitate the physical and political integration of Afghanistan but will also help unify international and domestic trade. Rebuilding the road network is also critical to facilitate humanitarian and development assistance. The reconstruction and rehabilitation works will utilize, to the extent possible, labor-intensive construction methods to provide much-needed employment and income generation opportunities. It will contribute to social stability by engaging, among others, refugees and excombatants. Production, trade, and commerce will be promoted, thereby expediting economic recovery and growth. A strengthened transport system will serve regional interests, with the possibility of reestablishing Afghanistan as a trade hub, bringing enormous benefits to the country.

6. **Need to Rehabilitate Power Infrastructure.** The power infrastructure of Afghanistan comprises mainly three isolated power systems centered around Kabul, Kandahar and Mazar Sharif cities. Of an estimated 230,000 electricity consumers in the country, about 76,000 are located in Kabul and its surrounding districts. The entire electric power infrastructure (covering generation, transmission, distribution, and consumer services) is in very poor condition, resulting in high system losses, poor service, low reliability of supply, and daily load shedding. The Government attaches highest priority to improving the power supply in Kabul.

7. The Kabul power system is supplied mainly by four snow-fed hydroelectric plants with an installed capacity of nearly 200 megawatts (MW)⁴ but with a firm output of only about 65 MW in the 2003 winter season due to the low availability of water compounded by the age of the generating plants. In addition, a diesel-fired gas turbine plant, recently rehabilitated with World Bank assistance, produces a peaking output of 45 MW. The peak load demand of Kabul city and its surrounding districts decreased from about 250 MW in 1996 to an estimated 160 MW in January 2003, since only about 40% of the network is operational, the remainder being damaged. The proposal for rehabilitation and reconstruction of the Kabul distribution network, together with the ongoing interventions by the World Bank and Kreditanstalt für Wiederaufbau (KfW) will contribute an additional 100 MW of peak load demand by the end of 2005. Consequently, there is a need in the short term to augment the power supply to Kabul by about 150 MW to meet the expected load demand of 260 MW. The least-cost option is through import of power from neighboring Turkmenistan and Uzbekistan by rehabilitation and reconstruction of existing transmission lines in the north.⁵

⁴ Darunta (3x4 MW), Mahipar (3x22 MW), Naghlu (4x25 MW), Sarobi (2x11 MW). However, the current combined working capacity is only about 160 MW. After rehabilitation of these four plants, provided by ongoing World Bank and European Union assistance, the combined generating output is expected to be restored up to about 200 MW, except during winter, when the low availability of water limits the combined firm output to about 80 MW.

⁵ According to the Ministry of Water and Power, Afghanistan and Uzbekistan have recently signed a 10-year power purchase agreement for the import of 150 MW at \$0.02 per kilowatt-hour to meet the short-term power supply shortfall in Kabul.

8. Technical losses are estimated to be about 25% (due to overloading of transmission and distribution equipment and makeshift, substandard overhead conductor and underground cable joints), while nontechnical losses (mainly due to pilferage and partly due to lack of reliable metering) are estimated to be as high as 20%. Besides contributing to the very high technical losses, exposed cable joints pose considerable safety risks to the public, especially during winter and rainy season, when the danger of electrocution for those walking accidentally into the vicinity of such joints is greatly increased. Hence, in addition to an urgent need to rehabilitate and reconstruct the Kabul distribution system to reduce system losses and ensure best use of the available power supply, there is also the need to minimize electrical hazards.

9. Da Afghanistan Brishna Moassesa (DABM), constituted under a special act, is responsible for generation, transmission, and distribution of electricity in Afghanistan. A president who reports to the deputy minister of the Ministry of Water and Power (MWP) heads DABM, which has about 5,200 staff but lacks technical skills and access to modern technology including computers and communication equipment. During the conflict period, maintenance and repairs could not be undertaken on the power generation, transmission, and distribution systems. This was exacerbated by non-availability of spare parts, tools, and testing equipment. Accordingly, staff morale and productivity is low. There is an urgent need to strengthen the capacity of DABM, particularly in project design and management, asset management, load dispatching, accounting, billing, revenue collection, and operation and maintenance (O&M).

10. **Need to Rehabilitate Gas Infrastructure.** Gas is produced at Sheberghan and is utilized largely in Mazar Sharif. Eight gas fields were discovered in the northern part of the country, of which three were developed, and gas production first commenced in 1967. In the earlier years, most of the country's gas production was exported to the Former Soviet Union based on an 18-year agreement. The export of gas ended in 1987 with the end of Soviet domination in Afghanistan, whereafter the export agreement was not renewed. The gas availability is grossly inadequate to meet the current requirements mainly due to loss of production facilities and high rate of leakage. Gas leakage represents not only a loss of revenue but also a major safety hazard. The immediate problems facing the gas subsector in Afghanistan relate to (i) lack of equipment, spare parts, and material to maintain the integrity of operations; (ii) inadequate resources for repair and rehabilitation of production wells, gas processing plant, and transmission and distribution pipelines; (iii) lack of expertise in geological and geophysical assessment of gas fields, including gas field management and reservoir depletion; and (iv) absence of corrosion prevention and cathodic protection of gathering mains and the transmission and distribution network. The quality of gas from some of the producing wells is not suitable for fertilizer production due to high hydrogen sulfide content in particular zones, and needs to be purified prior to transmission. The gas processing plant installed by the Russians for removal of hydrogen sulfide is not operating. The current gas production is about 830,000 cubic meters per day, of which 250,000 cubic meters per day leaks to the atmosphere. Present gas production is less than one fourth of the level produced in the early 1980s. For domestic consumption of gas, transmission pipelines were built from Sheberghan to Mazar Sharif, located at a distance of about 135 km. The consumers in the two cities and smaller towns and villages in the vicinity of the transmission lines are connected through distribution lines. The present network serves (i) a fertilizer factory including a 48 MW gas-fired thermal power plant at the factory site; (ii) the commercial sector such as bakeries, a textile factory, food processing plant, etc.; and (iii) domestic consumers for heating and cooking. Gas supply to domestic consumers is not metered, and tariff collection rate is very low.

11. There is need to optimize the use of indigenous natural gas and reduce dependence on petroleum fuel. The increased supply of natural gas will also help curtail the demand for fuel

wood, thereby reducing deforestation. At present, fuel wood accounts for about 75% of total energy supplies, and constitutes the basic source of energy for cooking and heating for the bulk of the population residing in rural areas. Rehabilitation and development of the existing gas infrastructure will mitigate environmental and safety hazards, reduce ecological problems, and promote efficiency of natural gas use. Accordingly, the Government has given a high priority to the rehabilitation and development of natural gas as a significant source of energy in the country.

C. Social Dimension and Impact on Poverty

12. Security and stability are critical for the recovery and development of Afghanistan. The Government is making efforts to establish the rule of law, bring provincial and local authorities under central control, build a national army and police force, and extend the tenure and expand the role of international security forces. Improved security and stability are necessary for further progress in infrastructure rehabilitation and reconstruction.

13. Poverty is endemic in Afghanistan. A large proportion of the population lived below any acceptable poverty line even prior to the civil conflict. The conflict has left them poorer, and new groups have joined the ranks of the poor. These include small and marginal farmers, especially in the rain-fed, arid, and semiarid regions with irrigation systems in disrepair and many fields still inaccessible due to mine infestation; landless workers in the agriculture sector; wage earners; nomadic populations whose herds have been decimated; returning refugees; internally displaced populations; ex-combatants; the disabled; as well as settled population groups in rural areas facing food needs as defined by the World Food Program (WFP).⁶ According to a preliminary estimate undertaken by ADB, about 53% of the population live below the poverty line of \$90 per capita per annum in 2002 prices, which is sufficient to meet the minimum energy requirement⁷ and an additional 30% allowance for nonfood items (see Supplementary Appendix A). The challenges of poverty reduction and reintegration of the displaced population are multifaceted, and a strong foundation is needed for all-round economic growth.

D. External Assistance and Aid Coordination

14. The pledges made by the aid agencies at the first conference on recovery and reconstruction of Afghanistan, held in Tokyo in January 2002, took some time to be realized into specific assistance projects. While there is significant assistance in the road sector by multilaterals (ADB, World Bank, and European Commission) and bilaterals (United States, Japan, Saudi Arabia, Italy, Sweden, Iran, and Pakistan), only a few agencies (Germany, European Commission, World Bank, and ADB) are providing assistance in the power sector. With the exception of ADB, there is no external support for the gas sector. See Appendix 2 for details.

15. Within the Government, the Afghan Assistance Coordination Authority (AACA) continues to play a strong role in coordinating external assistance in Afghanistan. The Government has taken three initiatives to improve aid coordination. First, the funding agencies have been requested to focus on specific (three) sectors. Second, the Government has established local level aid agency-government consultative groups covering 12 national development programs

⁶ The WFP food needs assessment is based on a minimum per capita daily requirement of 2100 kcal.

⁷ WFP. 2002. Afghanistan Countrywide Food Needs Assessment of Rural Populations 2002 - 2003. Therefore the percentage of population living below \$1 per day per capita would be much higher, maybe as much as 60-80%.

(NDPs)⁸ and four crosscutting advisory groups for gender, environment, humanitarian affairs, and human rights, with one designated external agency acting as the focal point. Third, the funding agency–government forum will be moving from the implementation group (IG) framework to a government-led consultative group (CG) process. ADB is the focal point for transport, natural resource management and environment. ADB is also a member of two other CGs covering energy, mining, and telecommunication; and public administration and economic management. ADB staff are actively engaged in the proceedings of the CGs, and the components for the proposed Project were developed in close consultation with other external agencies at the CG meetings.

E. Afghanistan’s National Development Framework and Budget

16. The goal of the Government’s National Development Framework (NDF) is to provide a strategic plan for the development of Afghanistan, around which all actors can unite, to address poverty and provide economic opportunity through a series of concrete programs and projects. The NDF is based on five principles: (i) the development strategy must be domestically owned, with the Government in the driver’s seat; (ii) markets and the private sector are more effective instruments than the state in delivering sustained growth; (iii) aid cannot be effective without the state investing in human capital and the creation of an institutional framework that allows the rule of law to prevail; (iv) promotion of sustainable economic growth requires active participation of the population; and (v) externally funded investments must be anchored in the Government’s development program to be successful over the longer term. The NDF focuses on three pillars of development: (i) security and human development, (ii) rebuilding physical infrastructure, and (iii) enabling the creation of a viable private sector as the engine for sustainable and inclusive economic growth. Restoring security and reestablishing law and order, administrative and financial reforms, and gender development are crosscutting priorities. The key challenges and priorities in the short term are to quickly establish basic security for the population, revitalize agriculture, facilitate private economic activity, and rebuild infrastructure and social services. The national development budget (NDB) translates the priorities of the NDF into programs and projects while simultaneously providing a vehicle for policy development. It provides an outline of ongoing and proposed investments within the NDF. The development budget for FY2004 was developed through the CG process and was presented at the Afghanistan Development Forum meeting held in Kabul in March 2003.

F. ADB’s Country Strategy and Program Update

17. The objective of the Country Strategy and Program (CSP) for Afghanistan (2002-2004) was to assist the Government in the reconstruction and rehabilitation of the country to ensure a seamless transition from humanitarian to reconstruction and development assistance. The CSP was endorsed by ADB’s Board of Directors in May 2002, paving the way for delivery of assistance earmarked for 2002. Since then ADB has approved the \$150 million Postconflict Multisector Program Loan (PMPL)⁹ and grant–financed technical assistance (TA) and other nonlending operations totaling \$37 million including a \$14.5 million capacity–building technical

⁸ (i) Refugee Return; (ii) Education; (iii) Health and Nutrition; (iv) Livelihood and Social Protection; (v) Culture, Heritage, Media, and Sports; (vi) Transport and Telecommunications; (vii) Urban Management; (viii) Energy and Mining; (ix) Natural Resource Management; (x) Trade and Private Investment; (xi) Public Administration; and (xii) Security and Rule of Law.

⁹ ADB. 2002. Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Afghanistan for the Postconflict Multisector Program. Manila.

assistance cluster (TAC),¹⁰ The program loan and TA will have indirect but broad-based positive impact for the country's reconstruction.

18. An update of the CSP covering 2003 – 2005 program has been circulated for Board consideration. The Country Strategy and Program Update (CSPU) follows the overriding objective of the CSP, and focuses on agriculture, transport, and energy sector based upon a number of considerations, including (i) the 12 NDPs and six national priority subprograms identified by the NDB, (ii) the government's expressed wish to limit each aid agency to three sectors, (iii) ADB's comparative advantage, and (iv) ADB and other funding agencies' operational experience in Afghanistan.

G. Lessons Learned

19. A number of lessons can be drawn from past emergency assistance projects, best practices, and initial lending and nonlending operations of ADB in Afghanistan in 2002. First, the strategic focus of ADB operations has to be closely linked to the Government's own strategies and priorities. Second, continued emphasis has to be given on capacity building to improve planning, project design and implementation, administration, and financial management. The Ministry of Finance (MOF) has successfully launched both the ordinary and the development budget. Systems are being put in place for fiscal accounting and transparency. Third, to the extent feasible, external funds should be channeled through the budget so that resources made available by the international community can be appropriately accounted for. Fourth, aid coordination through AACAs/CGs is extremely important for avoiding duplication and delays. Fifth, aid groups must work closely with MOF and the central bank to develop a viable and working payment system, without which funds flow has remained a difficult undertaking. Sixth, capacity building of executing agencies is vital, and consulting services for project design and implementation should have provision for training the EA staff in O&M of rehabilitated facilities. Seventh, the number of procurement packages should be minimized, keeping in view the implementation capacity of the EAs. Eighth, ADB's procurement guidelines should be flexibly applied for emergency assistance projects to allow reduced procurement periods for urgent delivery of project activities. These lessons have been carefully built into the design of the Project.

III. THE PROPOSED PROJECT

A. Objectives

20. The main objective of the Project is to help the Government rehabilitate and reconstruct key infrastructure in the transport and energy sectors that was damaged during two decades of conflict and neglect. It is anchored in the second pillar of the NDF. The proposed Project is in line with ADB's assistance strategy outlined in the ICSPU, which focuses, among others, on the national road network and international link roads, power, and gas development. While the Project involves rehabilitation of key infrastructure, the related policy and institutional reforms in

¹⁰ ADB. 2002. Technical Assistance Cluster to the Republic of Afghanistan for Capacity Building for Reconstruction and Development. Manila.

the transport and energy sectors are reflected in the ongoing PMPL.¹¹

B. Components and Output

21. The Project will rehabilitate damaged facilities through the provision of civil works; equipment/material; and consulting services for design, supervision of implementation, and evaluation. The Project will have three parts as described in the following paragraphs.

22. **Part A: Road Infrastructure.** This component will comprise urgently needed repair and rehabilitation to the Pule Khumri – Mazar Sharif – Sheberghan – Andkhoy section of the ring road, including the link to Uzbekistan (Naibabad – Hairatan road).¹² The road section generally meets the standards¹³ established by the Ministry of Public Works (MPW) for core roads in Afghanistan. However, shoulder widening and geometric improvements may be needed. Rehabilitation of bridges and cross-drainage structures will vary from minor repairs to restoring damaged sections. The roadside drainage needs to be improved. The 164 km road section from Pule Khumri to Naibabad (junction of road turning to Hairatan, border with Uzbekistan) requires pothole patching, crack sealing, shoulder restoration, and bituminous seal. The 25 km Naibabad – Mazare Sharif section, the 132 km Mazare Sharif – Sheberghan road section, and the 48 km section of the Sheberghan – Andkhoy road (72 km) is largely deteriorated and requires major pavement strengthening. The 24 km remaining section of Sheberghan – Andkhoy road requires embankment rehabilitation and construction of asphalt pavement. The 55 km Naibabad – Hairatan road section is continuously blocked due to shifting sand dunes that makes it impassable, requiring construction of barriers along the road in affected areas. Consulting services will be provided for design review, supervision of civil works contracts, and enhancing MPW O&M capacity. See Appendix 3 for details.

23. **Part B: Power Infrastructure.** This component will comprise (i) rehabilitation and reconstruction of damaged transmission lines and substations in the northern provinces to enable increased power imports; (ii) urgently needed rehabilitation and reconstruction of the Kabul distribution system, which was damaged during the conflict period; and (iii) consulting services for project management and on-the-job management support training. The rehabilitation and reconstruction of the Kabul distribution system will complement and integrate the efforts provided by the World Bank, KfW, and the European Commission to bring about a total improvement in electric power supply to Kabul city and surrounding districts, which will reduce system losses, improve security, and provide reliability and quality of electricity supply to users. Electrical hazards, specifically those attributed to exposed cable joints, will be minimized. This component will cover (i) rehabilitation of 230 circuit-kilometers (cct-km) of 220 kilovolts (kV) and 50 cct-km of 110 kV transmission lines; (ii) reconstruction of Khulum and Pule Khumri 220/110 kV substations, (iii) rehabilitation of distribution substations, junctions, transformers,

¹¹ The policy objectives in the transport sector include (i) creating an enabling framework for market-based competition and efficiency, (ii) establishing safe and reliable transport services, (iii) improving institutional efficiency, (iv) establishing a regulatory framework, (v) improving transparency and accountability, (vi) instituting mechanism for cost recovery, (vii) encouraging private sector participation, and (viii) establishing a system for national road improvement and maintenance. The policy objectives in the energy sector include (i) creating an efficient, safe, and reliable energy system; (ii) separating policy-making and regulatory functions from operational functions; (iii) capacity building of public utilities to improve generation/production, transmission, and distribution; (iv) improving cost recovery; (v) encouraging private sector investment; and (vi) improving corporate governance.

¹² The United States, Japan, Saudi Arabia, Iran, the World Bank, and the European Commission are providing assistance for rehabilitation of other sections of the ring road and international links. ADB is providing assistance through a Japan Fund for Poverty Reduction financed project that includes, among others, rehabilitation of the Kandahar – Spin Boldak road in the south.

¹³ These standards are consistent with international standards and are followed by all funding agencies assisting Afghanistan in road rehabilitation.

equipment, cables, and material; (iv) electricity service delivery including installation of 30,000 meters and utilization of low-voltage aerial bundled conductors, which are insulated to deter illegal connections; (v) load dispatch center for Kabul; (vi) billing, revenue collection, and computerization; and (vii) geographic information, asset management, and customer management systems. See Appendix 4 for details.

24. **Part C: Gas Infrastructure.** This component will comprise (i) provision for two mobile rigs to carry out workover activities for 12 gas wells; (ii) provision for two complete well wire line units to carry out down-hole flow tests; (iii) supply and installation of one skid-mounted gas sweetening plant; (iv) two containerized gas production testing laboratories; (v) repair and reconstruction of corroded gas transmission lines including pigging facilities and condensate disposal; (vi) repair and reconstruction of corroded gas distribution lines including installation of city gate station; (vii) cathodic protection system for corrosion mitigation of transmission and distribution pipelines; (viii) chemicals, tools, equipment, spare parts, instrumentation, piping and assemblies, and vehicles; (ix) consulting services for design, engineering, contract management, and construction supervision; (x) contracting services for gas well rehabilitation, repairs, and reconstruction of gas transmission and distribution facilities; and (xi) institutional strengthening and training of the Ministry of Mines and Industries (MMI) and Afghan Gas. See Appendix 5 for details.

C. Cost Estimates

25. The total cost of the Project is estimated at \$150 million equivalent, comprising approximately \$126.51 million in foreign exchange cost and \$23.49 million equivalent in local currency cost. The cost estimates are given in Table 1. A summarized cost table is included as Appendix 6, and detailed breakdowns are available in sector appendixes 3–5.

Table 1: Summary Cost Estimates
(\$ million)

Item	Foreign Exchange	Local Currency	Total Cost
Part A: Road Infrastructure	60.64	14.35	74.99
Part B: Power Infrastructure	26.76	3.24	30.00
Part C: Gas Infrastructure	18.12	1.98	20.10
Physical and Price Contingencies	10.81	2.00	12.81
Interest During Grace Period	10.18	1.92	12.10
Total	126.51	23.49	150.00
Percentage	84	16	100

D. Financing Plan

26. It is proposed that ADB provide a loan of \$150 million equivalent from its Special Fund resources, representing 100% of the total cost of the Project. The loan will finance the entire

foreign exchange and local currency costs of civil works, equipment, material, and services. The loan proceeds will not be used for costs of land, right-of-way, taxes, or duties.¹⁴

27. The loan will have a term of 40 years, including a grace period of 10 years, an interest charge at the rate of 1% per annum, and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan Agreement presented to the Board. In addition, the total amount of the interest charge during the grace period will be capitalized and charged to the loan account.

28. The Swedish International Development Agency (Sida) has expressed strong interest in cofinancing consulting services for the road infrastructure component. This will be firmed up during implementation.

E. Special Loan Terms

29. In view of the extraordinary postconflict situation in Afghanistan, the prevailing Asian Development Fund (ADF) lending terms approved by the Board are not appropriate for sustainable development in that country. It is therefore proposed that the loan be made on the concessional terms identical to those provided for the PMPL. These are (i) grandfathering pre-1999 ADF lending terms so that the loan has 40-year maturity including a 10-year grace period, with 1% interest charge throughout its term, and (ii) capitalizing interest during the grace period. The justification for the proposed loan terms is the same as for the PMPL and includes the following:

- (i) Afghanistan is just beginning to emerge from a long period of economic decline and stagnation and needs highly concessional resources now to develop its promising endowments (such as agriculture, gas, and mineral production) while its debt situation is carefully managed. It is therefore important that Afghanistan's income-generating capacity is developed without further straining its debt-repayment situation.
- (ii) Further analysis of debt sustainability by ADB and the International Monetary Fund concludes that borrowings of Afghanistan should be on a highly concessional terms for key projects and structural reforms for which grant financing cannot be found.

F. Implementation Arrangements

1. Project Management and Coordination

30. MOF will be the executing agency (EA) for the Project. Implementation of the Project will be managed by the relevant line ministries. As such, MPW will be the implementing agency (IA) for road infrastructure, MMI for gas infrastructure, and MWP will be the implementing agency for the power infrastructure.

31. A project coordination unit (PCU) will be established within MOF to monitor project implementation and coordinate with the aforementioned IAs. MOF will appoint a project coordinator and assign appropriate staff to assist in overseeing and monitoring project activities and milestones. A project steering committee (PSC), chaired by the deputy minister of finance, will be established to provide overall guidance and approvals required for smooth

¹⁴ The Government will allow duty-free import of equipment and material under Project-financed contracts.

implementation of the Project. The PSC will consist of the ministers of the IAs and will meet at least quarterly to review project implementation and to resolve, among others, interministerial coordination issues. The project coordinator will also serve as the secretary to the PSC.

32. Each IA will appoint a project director supported by adequate staff, who will liaise with the project coordinator for implementation of the respective components. See Appendix 7 for implementation arrangements. The consultants engaged under the Project and the TAC for capacity building (footnote 10) will develop capacity and assist IAs in implementation.

2. Implementation Schedule

33. As the Project is for emergency assistance, it will be implemented over 36 months starting from the date of loan effectiveness. A detailed implementation schedule is attached as Appendix 8.

3. Consulting Services

34. Consulting services will be required to assist the EA and IAs in implementation of the Project. The consulting services will involve Project management, detailed design, preparation of bid documents, assistance in procurement, supervision of construction and installation of equipment, testing and certifying completed works, training in management and O&M, and benefit monitoring and evaluation. The consultants will also assist the IAs in preparing initial environment examinations (IEEs) and environment management plans including disposal of hazardous wastes where applicable. In addition, the consultants will assist in developing social screening and mitigation plans as needed, and in monitoring poverty.

35. All consultants financed under the Project will be selected and engaged in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements for recruitment of domestic consultants acceptable to ADB. However, where required and justified, direct selection, negotiation, and hire procedures as allowed under emergency situations will be used. The outline terms of reference for consulting services under each component are provided in Appendixes 3–5.

4. Procurement

36. Procurement of goods, services, and civil works to be financed under the Project will be carried out in accordance with the ADB's *Guidelines for Procurement*, with provision for flexible application of such guidelines for emergency assistance projects.¹⁵ This involves, among others, shorter bidding period for international procurement if required. All international procurements, including other major procurements, will be undertaken by the AACA Procurement Unit with assistance from the international procurement advisor. The IAs will execute and administer the contracts as employer.

37. All contracts for civil works and supply of equipment and materials will be divided into suitable contract packages. The contracts have been mostly packaged as turnkey and design-build to ensure delivery within the project implementation period. The civil works contracts exceeding \$1 million will be awarded following international competitive bidding procedures. The contracts for equipment and materials valued at \$500,000 and below should be procured using international shopping procedures. For equipment and material contracts exceeding

¹⁵ As provided under Operations Manual Section 25: Rehabilitation Assistance After Disasters.

\$500,000, international competitive bidding procedures will be followed. Appendix 9 gives indicative contract packages.

5. Disbursement Arrangements

38. Loan funds will be disbursed in accordance with ADB's *Loan Disbursement Handbook*. Imprest accounts, primarily for incremental expenditures relating to administrative support for the IAs and the PCU, will be established with the PCU in the Ministry of Finance, in accordance with ADB's *Loan Disbursement Handbook*. The initial amount to be deposited into the imprest account will be a 6-month estimated expenditure that will be replenished on submission of statements of expenditures.

6. Advance Action

39. In view of the short implementation time frame, there is an urgency to commence procurement. Accordingly, ADB Management has approved advance actions for procurement of consulting services, civil works, equipment, and material. Such advance action incorporates general compliance with ADB's procurement requirements and procedures. Approval of advance action will not commit ADB to finance any part of the Project.

7. Accounting, Auditing, and Reporting

40. Overall project monitoring will be conducted by the PCU. In consultation with the IAs, the PCU will establish a system for preparing quarterly reports for performance monitoring, issues resolution, and periodic actions plans. These action plans, developed by the IAs, will incorporate quantitative and time-bound implementation targets and will be reviewed and approved by the PSC. The quarterly reports will serve as management feedback to update and improve procedures and project implementation. The PCU will ensure submission of the quarterly reports to ADB. Within 3 months of project completion, the PCU will prepare, with the assistance of the IAs, a comprehensive project completion report on the overall impact of the Project.

41. The Government will maintain separate accounts and records for the Project, including all components, in accordance with sound accounting principles. MOF will ensure that proper audit and accounting procedures are in place by the IAs to ensure efficient and economical use of the loan proceeds for the beneficiaries. Separate accounts and financial statements in relation to the Project adequate to identify the goods and services financed from the loan proceeds, financing resources, expenditures incurred, and the use of local funds will be maintained. Such accounts and financial statements will be maintained in accordance with sound accounting principles and certified by independent private auditors acceptable to ADB. The audited reports and related financial statements will be submitted to ADB no later than 9 months after the end of the fiscal year. The annual audits will also include audit of the imprest account and statement of expenditure records, and a separate opinion on such audit will be included in the audit report. The Government will facilitate ADB representatives to carry out spot and random checks on flow of funds and their use for the Project, work in progress and implementation.

8. Capacity Building and Institutional Strengthening

42. Capacity building of the government agencies/ministries and utility companies is essential for O&M of the rehabilitated infrastructure and facilities and to achieve the economic

and financial benefits. To this end, in the road sector, consultants engaged under the TAC¹⁶ (see footnote 10) are providing training to MPW and Ministry of Transport staff in project planning, design, procurement, financial management, and maintenance. In the power sector, consultants¹⁷ have been working closely with MWP and DABM counterparts to strengthen their capacity in project planning, design, asset management, load dispatching, accounting, billing, revenue collection, and O&M. In addition, under the Project, DABM will receive suitable training as well as tools, equipment, and spare parts to effectively operate and maintain the integrated northern power system and the Kabul distribution power system. Further capacity building of MWP is also planned in 2004.¹⁸ For the gas sector, the Project will provide operational training to MMI and Afghan Gas staff. Moreover, a separate TA in 2003¹⁹ will provide institutional strengthening in the sector.

9. Operation and Maintenance

43. All infrastructure rehabilitated and reconstructed under the Project will be operated and maintained by the relevant ministry/IA during and after completion of the works. Related O&M training of the IA staff will be part of the contracts for supervisory consultants and contractors for civil works, and supply and installation of equipment.

10. Project Performance Monitoring and Evaluation

44. The PCU will undertake quantitative and qualitative performance monitoring for each project component to evaluate the delivery of the planned facilities and the project benefits accrued. Within 6 months after the effective date of the Loan Agreement, the PCU, with the assistance of the Project Implementation Unit (PIUs) and Project-financed consultants, will develop a comprehensive project performance monitoring system (PPMS) in accordance with the ADB's standards. ADB will review and approve the PPMS. The PIUs will assist in carrying out the PPMS activities. ADB and the Government will agree on the performance parameters to be monitored during the implementation of the Project.

G. Environmental and Social Measures

45. The Project will have significant positive impact on, and will result in improvement of, the environment. All project components will be designed to follow environmental safeguards and technical specifications established for ongoing ADB-financed projects, which have already been subjected to ADB's initial environmental examination procedures. The Project will be prepared to follow the requirements of ADB's *Environmental Guidelines for Selected Infrastructure, Industrial, and Power Development Projects* and to comply with the ADB's *Environment Policy*. The responsible IAs will submit a waste management plan for the gas infrastructure component. An environmental monitoring system will be built into each project component including training for IAs to strengthen their capacity to deal with environmental problems, particularly hazardous wastes.

46. Community consultations were undertaken as part of the design of the Project. Mechanisms for maximizing local employment benefits, particularly for the destitute, landless

¹⁶ Component 3a: Capacity Building for Key Infrastructure Agencies Including Support for Feasibility Studies for Road Reconstruction Projects; and Component 3b: Capacity Building for Project Planning in the Transport Sector, for \$2.46 million and \$0.84 million, respectively, approved on 30 July 2002.

¹⁷ Component 3c: Capacity Building and Training of Ministry of Water and Power; for \$0.7 million, approved on 18 June 2002.

¹⁸ Proposed TA for Institutional Strengthening of MWP, for \$0.75 million in 2004.

¹⁹ Proposed TA for institutional Strengthening of Gas sector, for \$0.75 million in 2003.

laborers, internal displaced people, and ex-combatants will be included in the bidding documents. This will include road embankment rehabilitation under the road infrastructure component, which will maximize the use of local labor. ADB and the Government will ensure that a specific plan for local consultation to address safety, social, and cultural matters during project construction will be included in the bidding document. The Government will work closely with the local community leaders in the Project area to ensure that both men and women are given equal employment opportunities to benefit from the Project. Contractors will be required to ensure equal payment for equal work.

47. Rehabilitation and reconstruction of road, gas and electricity transmission and distribution facilities will occur on existing rights-of-way. Therefore, the Project will not entail land acquisition and resettlement. The rehabilitation works are designed, using engineering solutions, to ensure that reconstruction and rehabilitation will be within existing rights-of-way. No new roads, gas pipelines, or electricity transmission and distribution lines will be constructed.

48. However, several possible minor shoulder adjustments and movement of movable stalls and sheds may be necessary at certain locations. Urgency and the uncertain security situation require flexibility in applying social and related safeguard policies. At the same time, in order to undertake due diligence, avoid negative impacts, and ensure consistent treatment of social issues, a social assessment will be carried out in accordance with the social screening framework (Appendix 10). Its purpose will be to assist IAs in screening project components for likely social impacts, identifying documentation, ascertaining requirements, and preparing necessary mitigation plans for project components triggering safeguard policies. Social assessment will include a focus on gender impacts. Consultation and disclosure requirements will be simplified in consideration of the uncertain security situation in the country. The EA will submit a social assessment report to ADB for review and approval.²⁰ Based on field visits and public consultations in the project area for each component, the Project will have no negative impact on indigenous people or ethnic minorities.

IV. PROJECT BENEFITS, IMPACTS, AND RISKS

A. Impact on Poverty and Other Benefits

49. The Project will contribute to economic recovery, diversification of activities, employment generation, higher productivity, improved per capita income, increased revenue generation, improved efficiency and effectiveness of the public sector, private sector development, environmental preservation, and social stability. Specific beneficiaries will include, among others, the rural and urban poor, displaced populations, demobilized combatants, and women. Specifically, the benefits will be directly or indirectly attributable to different project components.

50. Road transport development will (i) improve the national road network; (ii) facilitate the movement of humanitarian aid through the northern corridor; (iii) reduce the cost of transportation; (iv) promote international and regional trade; (v) increase the income of the vulnerable groups in rural and urban areas; (vi) build up the capacity of local contractors for construction, rehabilitation, and maintenance of major roads and bridges; and (vii) promote environmental preservation. Road rehabilitation and reconstruction will open up a wide range of opportunities for the private sector involved in road construction, production, trade, transport, and services. Rehabilitated roads will improve the supply of and access to health, education, and other social services. The road component will assist some of the most vulnerable groups in the country in their repatriation, resettlement, and reintegration within their communities; provide

²⁰ The consultants under the TAC (footnote 10) will assist the EA/IAs in preparing the social assessment report.

livelihood; and develop capacity and skills that provide sustainability. Women's welfare will be promoted through improved availability and access to social services including education and health. Private sector development will open up opportunities for women entrepreneurs.

51. Energy development will (i) improve gas and electricity supply in terms of quantity, quality, reliability, safety and environmental impact; (ii) improve household quality of life; (iii) revive industries and establish new ones; (iv) contribute to energy security and self-reliance; (v) promote private sector activities including those owned and operated by women; (vi) make natural gas available where demand exists, and also stimulate demand for gas instead of fuel wood or imported oil; and (vii) make gas supply safe by avoiding the present problem of leakages. Tariff collection will improve the financial viability and reduce Government subsidy. Use of indigenous gas will save foreign exchange used to import energy. The increased and more reliable power supply will encourage private sector investment in all sectors, particularly manufacturing, commerce, and services. The improved power supply will improve the availability of safe water, and the quality of health services. Improvement in health care delivery will bring down maternal mortality. A summary of the poverty and social development strategy is presented in Appendix 11.

B. Economic and Financial Assessment

1. Economic Analysis

52. An economic analysis of the three components of the Project has been undertaken, and the findings and assumptions are summarized in the following paragraphs. Results of the base cases and sensitivity analysis for each component are given in Appendix 12. As the numbers suggest, investments in road and energy infrastructure are economically justified. However, the encouraging results for the energy components are dependent upon certain assumptions regarding achievement of sector restructuring and policy reforms as anticipated under the PMPL, leading to improvement of operational and administrative efficiency that will, among others, call for streamlining of tariff structure, accounting, billing, and collection, and reduction of transmission and distribution losses, as appropriate.

a. Road Infrastructure

53. The economic evaluation of the road rehabilitation component weighs the savings in vehicle operating costs and travel time costs²¹ gained by the Project against the initial investment costs and the savings in future periodic and routine maintenance costs over a 20-year period. The level of current average daily traffic on various road sections varies from a low of 1,505 to a high of 2,819. The economic evaluation indicates that the overall project is economically viable, with an Economic Internal Rate of Return (EIRR) of 31.5% and a net present value of \$167.5 million. The economic returns are quite robust, as indicated in the sensitivity tests by decreasing benefits by 20% and increasing costs by 20% and both: The EIRR varied from 23% to 27%. Similarly reduction of traffic growth rates by 25% and 50 % reduces EIRR to 29% and 26.5%, respectively. These sensitivity tests demonstrate that the overall project component is very robust considering increases in construction cost, implementation delays, and reduction in traffic growth.

²¹ Travel-time savings contribute less than 10% to the benefit stream.

b. Power Infrastructure

54. For the power component, the benefit streams identified over a 20-year operating period, 2007-2026 reflects the importance of electric power and its distribution to the economic recovery of the country. It has been assumed that failure to provide the minimum amount of electricity to Kabul envisaged by this Project would have significant repercussions on ADB's sector-specific economic growth projections (low case) for Afghanistan. Restricted to the manufacturing and the trade sectors, it has been estimated that 25% of the projected growth to 2015 and 10% of anticipated growth thereafter would fail to be achieved. These potential losses, to be avoided as a result of the Project, represent the principal benefits of the Project and are deemed conservative in light of the current situation and Kabul's present and projected predominance in the economy of the country. The project exhibits a robust EIRR of 32% and a NPV of \$414 million. Sensitivity analyses revealed that a 20% cost increase combined with a 20% decrease in benefits would still result in an EIRR of 23%.

c. Gas Infrastructure

55. Rehabilitation of existing pipeline and production wells appears to be the least-cost option compared with the drilling of new wells and/or building a new pipeline. The economic benefits of rehabilitating transmission and distribution facilities consist of revenues from the sale of an additional 320,000 cubic meters per day. The additional supply is attributed to 250,000 cubic meters savings from losses and 70,000 cubic meters from new production. Revenue has been calculated at current average tariff of about \$12.13 per 1000 cubic meters. The economic evaluation indicates that the overall Project is economically viable, with an economic internal rate of return of 35%. Sensitivity tests indicate that the overall project component is robust to variations in construction cost and benefits. A combined cost escalation of 20% and benefit reduction of 20% results in a decline of EIRR to 23%.

2. Financial Analysis

56. Financial analysis of the energy components (power and gas infrastructure rehabilitation) was undertaken. The financial rate of return for the Project is based on estimated incremental revenues and costs resulting from the operations of the power and gas infrastructure rehabilitated under the Project. Many assumptions underlying financial analysis are the same as those discussed earlier for economic analysis. Additional assumptions used here and findings are described in paras. 57 – 59. Details are provided in Appendix 13.

a. Power Infrastructure

57. The power sector is weak, as the power supply suffers from heavy losses, unreliable power generation, and damaged transmission and distribution systems. The technical and nontechnical losses are currently estimated at 45%. As an outcome of the Project, 200 MW at a load factor of 65% is expected to be generated in rehabilitated hydropower plants during summer, and 80 MW at a load factor of 90% during winter plus 45 MW from gas turbines as peak load during 6 hours per day. In addition, 200 MW will be imported from the neighboring Central Asian Republics (Turkmenistan and Uzbekistan) at a load factor of 65%, less 5% transmission losses. In calculating the FIRR for the base case, the current average tariff of 2.4 cents/kWh and the current total system losses have been used. The average cost of generation is estimated at 0.9 US cents per kWh, and 2.0 US cents per kWh is projected for the imported power. The technical losses are assumed to be 25%, and nontechnical losses 20%. The collection efficiency is extremely poor as well at 54%. Considering all these losses, the

collection/generation ratio totals only around 30%. Costs for O&M and administration are estimated at 5% of the invested capital.

58. Due to existing tariffs, limited technical resources, as well as lack of accurate administration, DABM is not financially viable at present. To make this Project component viable and at the same time bring DABM back to financial sustainability without heavy subsidies from the government budget, major restructuring efforts are needed. These efforts have to be carried out simultaneously with a review of the current tariff structure to achieve financial sustainability. To reflect possible opportunities, two scenarios have been analyzed aside from the above presented base case:

- (i) The first scenario assumes that the financial recovery is achieved solely through decreased technical and nontechnical losses directly derived from the project investments (from 45% to 30%) as well as increased average tariffs from currently 2.4 US cents per kWh to 7.3 US cents per kWh to attain a 15% FIRR on investment for this component.
- (ii) In attaining the same FIRR of 15%, the second scenario assumes major efforts in improving the administration of meter reading, billing, and revenue collection in avoiding too steep tariff increases. If the commercial losses, aside from the technical and nontechnical, can be brought down to 30% from the currently estimated 46%, after the implementation of this Project, the average tariff will be limited to 6.5 US cents per kWh.

b. Gas Infrastructure

59. Afghan Gas under MMI is responsible for production, transmission, and distribution of natural gas. Given its very low level of tariff collection, Afghan Gas is currently not a financially viable entity. Major restructuring efforts are needed with regard to administration, finance, accounting, billing, and revenue collection together with a review of the current tariff structure to restore profitability. The current supply of 580,000 cubic meters a day, after accounting for high losses (250,000 cubic meters a day) in transmission and distribution, cannot satisfy the estimated demand of 900,000 cubic meters a day. The average tariff of \$12.13 per 1000 cubic meters is well below the comparable tariff in neighboring countries. Using the current rates and volumes as presented by Afghan Gas, assuming a restructured Afghan Gas with (O&M) cost of 5% and even with minimal losses in transmission and distribution, the component is not financially viable. Major tariff rationalization is needed, as the current tariffs are significantly below current prices in neighboring countries. About 3.65 times increase in tariff will result in a financial internal rate of return (FIRR) of 15%. In addition, the existing collection rate also needs major improvements. A collection rate of 75% for industrial/commercial consumers and 50% for domestic consumers is assumed for achieving the 15% FIRR. Sensitivity analysis shows that a reduction in the proposed level of tariff and collection rate will reduce the FIRR, however financial viability could still be achieved with a different combination of tariff increase and reduction in collection rate.

C. Project Sustainability

60. Though not a primary concern for emergency assistance projects where restoration of infrastructure and facilities is critical, sustainability considerations are important for long-term viability. The road component of the Project relies on toll collection on the improved roads for funding of maintenance. Generating road maintenance revenues through toll collection has

been in practice since 1974 in Afghanistan. Though the system has been modified over the years and may not be fully in practice at present, tolls offer a viable short-term means to finance road maintenance. MPW is in the process of reviving tolls on the improved road sections. For sustainable funding of maintenance in the long term, the ongoing review of the transport sector, sponsored by Sida and supported by ADB and the World Bank, is preparing recommendations for establishing a road fund with revenues generated through fuel levies, vehicle licensing, and road user charges.

61. For the gas and power components, the Project includes capacity building efforts at the operational level that will improve the O&M capacity of DABM and Afghan Gas. The Project-proposed enhancement in tariff, reduction of technical and nontechnical losses, and increase in collection rates are critical for the financial sustainability of these institutions. Major institutional improvements have a key role in achieving these objectives. It is recognized that full cost recovery will take time. Since the energy components are networked systems, it is difficult to achieve cost efficiencies at this stage. Cost recovery is actually the next step after the transmission and distribution systems have been rehabilitated and improved through the Project. However, the Government has shown deep commitment to pursue the reforms and set specific targets for achieving institutional improvements and enhancing cost recovery during the recently concluded Afghanistan Development Forum.

D. Environmental Impact

62. The Project is classified as a Category B environmental Project, as it is unlikely to have any significant adverse environmental impacts. For the road and power distribution and transmission lines, the rehabilitation will follow existing alignments. Hence, these components are deemed to have minor environmental impacts. In addition, the power distribution and transmission component will not involve replacement of transformers and conductors, and therefore there will be no scrap equipment containing polychlorinated biphenyl. Environmental impacts related to the construction activities will be mitigated and will be incorporated into the contractor's responsibilities. While the gas infrastructure component will improve the environmental conditions of the project area, these components will involve activities that generate environmental problems related with hazardous wastes. Therefore, a waste management plan will be prepared and submitted to ADB prior to executing any construction work. Environmental monitoring, particularly for pollution into the water, will be developed as a part of project implementation. The summary initial environmental examination is attached as Appendix 14.

63. The road component will improve the environment in a number of ways: (i) improving the supply of fuel, thereby reducing pressure on forests for fuel wood; (ii) improving fuel efficiency, thereby saving fuel and reducing pollution; (iii) stabilizing embankments; (iv) preventing erosion; (v) channelizing water; and (vi) reducing permanent loss of agricultural land from encroachment by vehicles along roads. The Project will optimize the use of natural gas, reduce dependence on petroleum, and curtail the demand for fuel wood, thereby saving forests. Safety will be improved as pipeline leakages are eliminated. A cathodic protection system for the buried gas pipelines will safeguard against corrosion.

E. Risks

64. Implementation of the Project entails a number of risks:

- (i) The overall political and security situation remains volatile. ADB will need to closely monitor the situation and coordinate with local and central authorities and the United Nation to ensure adequate protection.²²
- (ii) Government implementation capacity being very weak, there may be undue delays in implementation of key activities. Also the lack of accounting and auditing capacity implies a risk of corruption. Resources have been allocated for consultancy services to assist in project management and implementation. Additional capacity–building initiatives focused on financial management have been provided under the TAC. Besides, MOF will establish a strong coordination and monitoring mechanism. ADB will also field review missions as frequently necessary.
- (iii) The Government may not provide counterpart resources, in a timely manner, of the type required. ADB will work closely with AACAA, MOF, and the IAs to address this issue.
- (iv) Rehabilitated roads may not be maintained properly, leading to rapid deterioration. The deterioration process will be further accelerated by lack of axle load controls. The adjustment cost for policy reforms under the PMPL includes resources for road maintenance and establishment of weighing stations. The Government will be encouraged to make appropriate allocation of budgetary resources for this purpose.

V. ASSURANCES

A. Specific Assurances

65. The Government has given the following specific assurances, in addition to the standard assurances, which will be incorporated in the legal documents:

- (i) The Government will provide adequate security for the smooth and uninterrupted implementation of the Project.
- (ii) The Government will ensure that the objectives, policies, and actions set forth in the development policy letter dated 4 November 2002 and the policy matrix attached to the development policy letter (together, the Policy Letter) relating to ADB's Postconflict Multisector Program Loan to the Government will (a) be achieved, adopted, undertaken, and implemented in the manner stipulated in the Policy Letter; and (b) continue to be in full force and effect during the implementation and O&M stages of the Project.
- (iii) The Government will allocate and make available, in a timely manner, sufficient funds from its budget for each fiscal year for the O&M of the project facilities and will ensure that such facilities are operated and maintained in accordance with sound practices in the transport and energy sectors. For the maintenance of the road component of the Project, the Government will, as a short–term measure, ensure implementation of a toll collection system on improved roads. Based on the recommendations of the ongoing Transport Sector Review, the Government

²² Coordination with the United States–sponsored provincial reconstruction teams providing security for development activities in Kabul and other provinces may also be explored.

will, in a timely manner, establish sustainable means for revenue generation such as setting up a dedicated road maintenance fund based on fuel levies, vehicle licensing, and other road user-related taxes.

- (iv) To ensure long-term viability of the power component of the Project, the Government will, before the completion of the power component, finalize and enter into long-term power purchase/supply agreements with its neighboring countries for sufficient and uninterrupted supply of electricity to the country.
- (v) To secure an adequate and continuous supply of electricity to the country, the Government will comply with its payment obligations under the aforesaid power purchase/supply agreements. For such purpose, the Government will, if necessary, allocate and set aside adequate funds from its budget for each fiscal year to meet its payment obligations under such agreements.
- (vi) The Government will adopt and implement strict measures (a) for improved metering, billing, and collection of arrears for the power and gas components of the Project; and (b) to eliminate evasion of electricity payments by consumers.
- (vii) The Government will, if necessary, increase power and gas tariffs to achieve full cost recovery in the medium term based on actual technical and nontechnical losses. In case the Government decides to protect vulnerable groups against the adverse impacts of tariff increases by subsidization, it will ensure that such support will be paid directly from its budget and the subsidy will be targeted for the poor.
- (viii) The Government will ensure timely construction and implementation of the Pule Khumri 220 kV transmission line segment to guarantee successful commissioning of the proposed Project, in particular, transmission of at least 150 MW of electricity to Kabul. The Government will also ensure the integration and correlation of the proposed Project with the Pule Khumri 220 kV transmission line segment.
- (ix) The Government will ensure that no duties or other similar levies will be imposed on any equipment, material or services required for the Project, and if such duties and levies are imposed, they will be paid by the Government promptly to ensure timely project implementation.
- (x) To the extent feasible, the Government will ensure that the reconstruction and rehabilitation of the project components will be carried out on land already acquired and/or owned by the Government. The Government will further ensure that no persons will be adversely affected in terms of the ADB's *Policy on Involuntary Resettlement* and ADB's *Policy on Indigenous People*. In case there are adjustments to the rights-of-way that necessitate land acquisition, a social screening and assessment plan will be prepared by the EA and submitted to ADB for review and approval to ensure that the social and economic base of the affected persons will be restored and/or enhanced through mitigating measures. The Government will also ensure that, if essential, all land and rights-of-way required for project implementation will be made available in a timely manner.

- (xi) The Government will ensure that adequate environmental protection and safety measures are included in the design of the project facilities; and that the Project is implemented, operated, and maintained in accordance with ADB's *Environmental Guidelines for Selected Infrastructure, Industrial, and Power Development Projects* and ADB's *Environment Policy*, as amended from time to time, and the recommendations made in the management plan set out in the IEE.
- (xii) The Government will ensure that a specific plan for local consultation to address safety, social, and cultural issues, during project implementation, will be included in the bidding documents. The Government will further ensure that men and women are given equal employment opportunities for benefits from the Project. The mechanisms for maximizing local employment benefits will be included in the project design and the bidding documents.
- (xiii) The Government will ensure that the civil works contracts include legally mandated provisions on health and sanitation and on appropriate working conditions, including accommodation, where appropriate, for construction workers at campsites during the construction period.
- (xiv) Within 3 months of loan effectiveness, the Government will establish fully staffed and equipped offices of the PCU in MOF and PIUs in MPW, MMI, and MWP.
- (xv) Within 3 months of loan effectiveness, the Government will establish a PCU, chaired by the deputy minister of finance and consisting of the ministers of the IAs, with the project coordinator serving as the secretary.

B. Condition for Loan Effectiveness

66. The Government will appoint the project coordinator and project directors of the PIUs in consultation with ADB.

VI. RECOMMENDATION

67. I am satisfied that the proposed loan would comply with the Articles of Agreement of ADB and recommend that the Board approve

- (i) the loan in various currencies equivalent to Special Drawing Rights 110,018,000 to the Transitional Islamic State of Afghanistan for the Emergency Infrastructure Rehabilitation and Reconstruction Project, from ADB's Special Funds resources with an interest charge at the rate of 1% per annum, a term of 40 years, including a grace period of 10 years, and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan Agreement presented to the Board; in addition, the total amount of the interest charge during the grace period will be capitalized and charged to the Loan Account; and
- (ii) in respect of such loan, a variation from the existing loan terms under ADF resources on an exceptional basis.

<p>3. Gas infrastructure</p> <p>4. Asset management</p> <p>5. Billing and revenue collection</p> <p>6. Operation and maintenance</p>	<p>Gas production and distribution facilities in Sheberghan will be rehabilitated</p> <p>13 km transmission line to Mazar Sharif will be rehabilitated</p> <p>Database of rehabilitated Kabul distribution network created</p> <p>30,000 more electricity consumers will be metered and billed. Collection rate to increase to 60%</p> <p>Improved metering and collection for gas</p> <p>Adequate O&M budget provided</p>		
<p>Inputs</p> <p>1. Road infrastructure</p> <ul style="list-style-type: none"> • Civil works • Consulting services / project management <p>2. Power infrastructure</p> <ul style="list-style-type: none"> • Equipment procurement • Installation and testing • Consulting services / training <p>3. Gas infrastructure</p> <ul style="list-style-type: none"> • Equipment procurement • Installation and testing • Well rehabilitation • Consulting services/ training 	<p>\$89.96 million</p> <p>\$35.97 million</p> <p>\$24.07 million</p>	<p>ADB project performance reports</p>	<p>Timely procurement and execution</p> <p>Completed works of specified quality</p> <p>Effective supervision of works and training of counterpart Implementing Agency (IA) staff by consultants</p>

EXTERNAL ASSISTANCE

1. In the road sector, rehabilitation of the primary national road network (the ring road and international connections) is of highest priority. The major external agencies financing these rehabilitation works are (i) the United States through the United States Agency for International Development (USAID), (ii) Japan through the Japan International Cooperation Agency (JICA), (iii) the World Bank, (iv) the Asian Development Bank, (ADB); (v) the European Commission, (vi) Sweden through the Swedish International Development Agency, (vii) Italy, (viii) Iran, (ix) Pakistan, and (x) Saudi Arabia.

2. The power sector in Afghanistan is currently supported by four major agencies: (i) ADB, (ii) Germany through Kreditanstalt für Wiederaufbau (KfW) and Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), (iii) USAID, and (iv) the World Bank. The European Commission is providing cofinancing for the KfW project to carry out investments in the power sector. JICA has appraised some urgent power infrastructure rehabilitation works in Kabul, though these are yet to be approved by the Japanese Government. Other bilaterals (Iran and India) have shown interest, but the details need to be confirmed.

3. In the gas sector, the bulk of assistance is being provided by ADB in the form of technical assistance. The World Bank is also providing technical assistance for policy, regulatory, and technical support in a number of sectors including gas.

4. Table A2.1 – A2.3 summarize external assistance in road, power, and gas sectors.

Table A2.1: External Assistance in the Road Sector

Project	Agency	Duration	Amount (\$million)
1. Technical Assistance			
Road Construction Management and Policy Development	Japan	2003–04	–
Training in Highway Engineering for Afghan Officials in Tripartite Arrangement with Malaysia	Japan	2003	4.20
Rehabilitation of Economic Facilities and Services Program ^a	USAID	2002-04	11.95
Economic Governance Program ^a	USAID	2002-04	1.50
Capacity Building for Key Infrastructure Agencies for Road Rehabilitation/Reconstruction	ADB	2002-04	2.46
Capacity Building for Project Planning in the Transport Sector	ADB	2002-04	0.84
Development of Framework and Legislation for Cross Border Transport	ADB	2002-04	0.50
Transport Sector Review	Sida	2002-03	0.80
Design and Supervision of Kabul - Jalalabad road	Sida	2002-03	3.70
2. Investment			
Grading of Kabul – Jalalabad Road (227 km)	Sida	2002-03	1.30
Temporary Bridges for Kabul – Salang Road	Sida	2002-03	1.10
Kabul – Kandahar Road (150 km)	Japan	2002-05	50.00
Kabul – Kandahar Road (100 km)	USAID	2002-03	36.70
Kabul – Kandahar Road (200 km grading and paving)	USAID	2002-05	35.00
Kabul – Kandahar Road (200 km grading and paving)	Saudi Arabia	2002-05	30.00
Kandahar – Lashkargah (43 km)	USAID	2002-05	15.00
Kabul – Jalalabad (227 km)	EC	2003-05	80.00
Kandahar – Spin Boldak Road (105 km)	ADB/JFPR	2002-05	15.00
Herat – Islam Qila (123 km)	Iran	2002-03	–
Kabul – Doshi (182 km) and Pule Khumri – Shir Khan Bandar (221 km)	World Bank	2003-06	69.00
Taloqan – Faizabad (169 km)	World Bank	2003-06	23.00
and Charikar – Bamiyan (160 km)	/Italy		
Jalalabad – Torkham (70 km)	Pakistan	2003-05	–

Table A2.2: External Assistance in the Power Sector

Project	Agency	Duration	Amount (\$ million)
1. Technical Assistance			
Capacity Building and Training for the Ministry of Water and Power	ADB	2002-03	0.70
Study of Power Interconnection for Regional Trade	ADB	2002-03	0.50
2. Investment			
Rapid Support Program for Kabul Power	KfW	2002-03	11.00
Rapid Support Program for Kabul Power	EC	2002-03	9.00
Infrastructure Reconstruction Project	World Bank	2002-04	15.00

Table A2.3: External Assistance in the Gas Sector

Project	Agency	Duration	Amount (\$ million)
Technical Assistance			
Assessing Gas Sector Rehabilitation Requirements	ADB	2002-04	0.30

ADB = Asian Development Bank, EC = European Commission, JFPR = Japan Fund for Poverty Reduction, KfW = Kreditanstalt für Wiederaufbau, Sida = Swedish International Development Cooperation Agency, USAID = United States Agency for International Development.

^a Includes energy sector.

ROAD INFRASTRUCTURE

A. Rationale

1. Afghanistan is a landlocked country. With a large area (of about 652,000 square kilometers) and population of 24 million widely spread across the largely mountainous terrain, roads are the only means of transport not only for facilitating urgent humanitarian aid and returning refugees, but more importantly for economic revival and development. Key components of the primary road network are the 2,200 kilometer (km) ring road that connects Afghanistan's major regional centers (Herat, Kandahar, Mazar Sharif, Meymaneh and Sheberghan) with Kabul and the six international links to neighboring countries (Iran, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan). These roads are essential to Afghanistan's economy, but they have suffered widespread damage due to the last 20 years of hostilities, allied with the lack of any effective maintenance. The general condition of these roads is poor to very poor, which results in long journey times and high transport costs. International trade is stifled by these poor road links, and agricultural development is suppressed by the difficulties growers have in transporting perishable goods to the main population centers.

2. To keep up with increasing traffic volume, to promote trade links with neighbouring countries, and to improve movement of goods and services, thereby fostering trade and commerce, it is essential that the entire primary road network be rehabilitated on a priority basis. This is also supported by the findings of the comprehensive needs assessment (CNA)¹ for the transport sector. The road rehabilitation efforts should not only respond to the current requirements of domestic trade but also start taking advantage of the possibilities of expansion of regional trade. The Government has declared that reconstruction and rehabilitation of the road system, especially of national roads, is the country's top priority in reconstruction. Improved roads will not only facilitate the physical and political integration of Afghanistan but also help unify the international and domestic trade of Afghanistan. Rebuilding the road network is also critical in facilitating humanitarian and development assistance. The reconstruction and rehabilitation work will maximize labor-intensive construction methods, providing much-needed employment and income generation. It will contribute to social stability, by engaging, among others, refugees and ex-combatants. Production, trade, and commerce will be promoted, thereby expediting economic recovery and growth. A strengthened transport system will serve regional interests, with the possibility of reestablishing Afghanistan as a trade hub. The benefits for Afghanistan will be enormous.

B. Objectives and Scope

3. The main objective of this project component is to promote economic development by carrying out rehabilitation of the primary road network in northern Afghanistan. This will improve local, regional, and international access and will reduce transport costs and journey times. The road will be restored to a good maintainable condition, and road maintenance costs will be reduced.

4. The scope of work covers rehabilitation and reconstruction² of (i) 392 km of the primary ring road running between Pule Khumri, Mazar Sharif, Sheberghan, and Andkhoy;

¹ The transport sector CNA was based on findings of a joint aid mission in March 2002. The report was finalized in May 2002.

² The Ministry of Public Works standards for national roads, which are consistent with international standards, include 7 meters (m) pavement with 2 m shoulders (partly paved or improved) on either side. These standards have been agreed among the aid agencies providing assistance for rehabilitation of national roads in Afghanistan.

and (ii) 55 km of the primary international link that runs from the Naibabad junction (some 25 km east of Mazar Sharif) to the border crossing with Uzbekistan at Hairatan.

C. Components and Output

5. The project component comprises (i) rehabilitation of 157 km of existing road pavement (Naibabad Junction to a point 22 km east of Andkhoy); (ii) crack sealing, patching, and a surface seal of 219 km of existing road pavement (Pule Khumri to Naibabad Junction and Naibabad Junction to Hairatan); (iii) construction of 22 km of road pavement on an existing embankment (east side of Andkhoy); (iv) reconstruction of 1 bridge that has been washed out; (v) rehabilitation and repair of 66 existing bridges and 388 existing drainage structures and culverts; (vi) stabilization of embankment slips; (vii) construction of busbays and turnouts; (viii) provision of other safety features such as guard railings, road markings and road signs; and (ix) consulting services for design review, project management, and construction supervision.

D. Cost Estimates

6. The total cost of the road infrastructure component is estimated at \$89.96 million equivalent as summarized in Table A3.1.

Table A3.1: Cost Estimates
(\$ million)

Item	Foreign Exchange	Local Currency	Total Cost
Civil Works	55.09	13.77	68.86
Consulting Services	4.24	0.29	4.53
Incremental Administrative Support	1.31	0.29	1.60
Physical and Price Contingencies	6.21	1.47	7.68
Interest During Grace Period	5.89	1.40	7.29
Total	72.74	17.22	89.96

E. Implementation Arrangements

7. MPW will be the implementing agency (IA) for the road component of the Project. A project implementation unit (PIU) under a project director will be established by MPW to oversee implementation. The project director will be responsible, inter alia, for the overall management, coordination, and monitoring; audit of Project accounts and financial statements; and preparation of progress reports. The PIU will function under the overall supervision and guidance of the project steering committee under the Ministry of Finance. The Procurement Unit of the Afghan Assistance Coordination Authority will undertake all procurement of civil works, goods, and services through the international procurement advisor. MPW will execute and administer all contracts through PIU.

F. Consulting Services

8. The IA will be assisted by a firm of international consultants reporting to the project director. The consultants will be responsible for providing support during the tendering and contract award procedures, review of detailed design submissions prepared by the contractors, construction supervision, auditing the contractors' quality assurance procedures, and project management. An estimated 250 person-months of international and 450 person-months of domestic consulting services will be required.

9. The tasks of the consultants will include, but not be limited to, the following:

- (i) function as employer's representative in administering the two civil works contract packages (contracts) for rehabilitation and reconstruction of the project roads;
- (ii) review and approve the detailed engineering design carried out by the two civil works contractors;
- (iii) ensure that the permanent and temporary works are designed and constructed in accordance with the provisions of the contracts;
- (iv) review the applications for payment submitted by the contractors and prepare interim and final payment certificates, showing payments due under the provisions of the contracts;
- (v) review all claims submitted by the contractors and provide advice to the employer on the validity of the claims, the effect of such claims on the construction schedule, and the cost of the Project;
- (vi) conduct safety audits and prepare recommendations for improving road safety;
- (vii) ensure that the construction methods as proposed by the contractors for carrying out the works are in accordance with sound environmental standards, and the environmental mitigation measures described in the initial environmental examination are implemented;
- (viii) advise the MPW on all matters concerning implementation of the contracts; and
- (ix) prepare detailed social screening and mitigation plans for the project components (road, power, and gas) with significant impact on affected people, and develop poverty monitoring and impact assessment systems.

G. Contract Packages

10. The Project component construction works will be carried out under two contract packages as shown in Table A3.2.

Table A3.2: Contract Packages

No.	Road Links	Contract Type	Mode	Estimated Value ³ (\$ million)
1	Pule Khumri to Mazar Sharif Naibabad Junction to Hairatan	design-build	ICB	29.5
2	Mazar Sharif to Sheberghan to Andkhoy	design-build	ICB	47.0

ICB = international competitive bidding.

H. Operation and Maintenance

11. MPW is responsible for the operation and maintenance of the primary road network. In the past, road maintenance was carried out under force account or through its parastatal construction department. Due to lack of funds, at present MPW is able to carry out only the emergency maintenance, particularly in the northern region. Lack of skilled manpower for planning and management, and lack of operational plant and equipment are generic causes for low maintenance capability. This situation is not likely to improve unless the whole spectrum of maintenance funding issues, management, and implementation activities at the national, regional, and local levels are addressed. Under the Asian Development Bank (ADB)-financed technical assistance cluster (TAC), maintenance management expertise is

³ See detailed cost breakdown in Table A3.3.

imparted to MPW staff in terms of carrying out inventory and road condition surveys. Under the same TAC, ADB is assisting the Swedish International Development Cooperation Agency–sponsored Transport Sector Review, which involves review of the policy, institutional, and sector needs. The Transport Sector includes, among others, preparation of recommendations for road maintenance funding, planning and implementation with a move towards funding through cost recovery from road users, and the use of private sector contractors to perform periodic and routine maintenance. MPW is reviewing an old system of toll collection on both sides of the Salang tunnel and in the Kabul area. If successful, this seems to be an appropriate short-term solution for generating revenues for maintenance of improved roads.

12. At the present time, there appears to be no effective control of axle loads on vehicles carrying goods. Vehicles are overloaded in terms of weight and height of the load. Not only does this impact on safety, but overloaded vehicles reduce the effective life of the rehabilitated pavement. Effective action to control axle loads needs to be taken at the national level in the first instance through installation of weighing devices⁴ at selected locations on the national road network.

Table A3.3: Detailed Cost Estimates
(\$ million)

Item	Foreign Currency	Local Currency	Total Cost
Road Rehabilitation Contract 1			
(Pule Khumri to Mazar Sharif and Naibabad Junction to Hairatan - 244 km)			
Preliminary Items	2.7	0.7	3.4
Earthworks	2.1	0.5	2.6
Pavement	10.0	2.6	12.6
Structures	4.5	1.1	5.6
Road Furniture	2.1	0.5	2.6
Service Diversions	0	0	0
Contingencies	2.2	0.5	2.7
Subtotal	23.6	5.9	29.5
Road Rehabilitation Contract 2			
(Mazar-Sharif to Sheberghan to Andkhyo – 204 km)			
Preliminary Items	5.3	1.3	6.6
Earthworks	1.9	0.6	2.5
Pavement	23.6	6.6	30.2
Structures	0.7	0.2	0.9
Road Furniture	2.0	0.4	2.4
Service Diversions	0.1	0.0	0.1
Contingencies	4.1	1.0	5.1
Subtotal	37.7	9.3	47.0
Total for Road Rehabilitation Contracts 1 and 2	61.3	15.2	76.5
Consulting Services	4.2	0.3	4.5
Other Costs	7.2	1.7	8.9
Total Cost	72.7	17.2	89.9

⁴ Under the Postconflict Multisector Program Loan, the adjustment cost includes provision of weighing devices to be installed at a number of locations on the ring road and international link roads.

POWER INFRASTRUCTURE

A. Rationale

1. The power infrastructure of Afghanistan comprises mainly three isolated power systems centered around Kabul, Mazar Sharif, and Kandahar cities. There is no national grid. The entire electric power infrastructure (covering generation, transmission, and distribution equipment, and consumer service connections) is in a very poor condition, caused by almost continuous conflicts over the last two decades. The overall power system is characterized by daily rationing of electricity, frequent brownouts caused by system faults and a dysfunctional protection system, aging power generation plants, missing overhead transmission and distribution lines, hazardous exposed cable joints, and high system losses. The electrification ratio is estimated to be only about 6% and the annual per capita consumption of electricity is estimated to be about 16 Kilowatt-hour (kWh), which ranks among the lowest in the world. Of an estimated total of about 230,000 electricity consumers in the country, about 76,000 are located in Kabul and its surrounding districts.

2. The Kabul power system is supplied mainly by four snow-fed hydroelectric plants with an installed capacity of nearly 200 megawatts (MW)¹ but with a firm output of only about 65 MW in the 2003 winter season due to the low availability of water compounded by the aging generating plants. A diesel-fired gas turbine plant, recently rehabilitated with World Bank assistance, produces a peaking output of 45 MW. The peak load demand of Kabul city and its surrounding districts decreased from about 250 MW in 1996 to an estimated 160 MW in January 2003, as only about 40% of the distribution networks are operational, and the rest of the networks have only poles standing, with line conductors missing. The proposed rehabilitation and reconstruction of the Kabul distribution network together with the ongoing interventions by the World Bank and Kreditanstalt für Wiederaufbau (KfW) will contribute an additional 100 MW of peak load demand by end 2005. Hence, there is a need in the short term to increase the power supply to Kabul by about 150 MW to meet its expected peak load demand of 260 MW.² The least-cost option is through power imports from neighboring Turkmenistan and Uzbekistan (see para. 4).

3. Technical losses are estimated to be about 25% (due to overloading of transmission and distribution equipment and makeshift substandard overhead conductor and underground cable joints), while nontechnical losses (due mainly to pilferage and partly to lack of reliable metering) are estimated to be as high as 20%. Besides contributing to the very high technical losses, exposed cable joints pose considerable safety risks to the public, especially during winter and rainy periods when the danger of electrocution for those walking in the vicinity of such joints is greatly increased.

4. Afghanistan currently imports, based on yearly annual power purchase agreements, up to 25 MW each from Turkmenistan (via existing 110 kilovolt [kV] transmission link) and Uzbekistan (via damaged 220 kV link but operated at 110 kV) to supplement the load demands centered around Andhkoy, Sheberghan, and Mazar Sharif in the northern provinces. According

¹ Naghlu (4x25 MW), Mahipar (3x22 MW), Sarobi (2x11 MW), and Darunta (3x4 MW). However, the current combined working capacity is only about 160 MW. After rehabilitation of these four plants, provided by ongoing World Bank and European Commission assistance, the combined generating output is expected to be restored up to about 200 MW, subject to availability of water. During winter, the low availability of water limits the combined firm output to about 80 MW.

² The expected peak load demand of 260 MW, only 4% higher than the 1996 actual figure of 250 MW, is constrained by the limited extent of damaged distribution networks being rehabilitated and reconstructed with funding from the World Bank and KfW, and to be rehabilitated and reconstructed under the proposed Project.

to the Ministry of Water and Power (MWP), Afghanistan and Uzbekistan have recently signed a 10-year power purchase agreement for the import of 150 MW from Uzbekistan at an initial price of \$0.02 per kWh for the first year³ to meet the acute power supply shortfall in Kabul.

B. Objectives and Scope

5. The power component of the Project will focus on (i) rehabilitation and reconstruction of damaged transmission lines and substations in the northern power system to enable increased power imports; (ii) rehabilitation and reconstruction of damaged Kabul distribution network to restore electricity supply to consumers and reduce system losses; and (iii) consulting services for detailed design, engineering, and project implementation supervision. This component has been formulated in close consultation with MWP, taking into account the assistance committed by other development partners in the subsector. The rehabilitation and reconstruction of the Kabul distribution system will complement and integrate the efforts provided by the World Bank, KfW, and the European Commission to bring about a total improvement in electric power supply to Kabul city and surrounding districts that will reduce system losses, improve security, provide reliability and quality of electricity supply to residential and commercial users, and also support light industries to promote economic growth. Damaged equipment will be replaced to ensure that electrical hazards, specifically those attributed to exposed cable joints, will be minimized. The related policy and institutional reforms in the power subsector are reflected in the Asian Development Bank (ADB)-financed Postconflict Multisector Program Loan.⁴

C. Components and Outputs

6. The power component will cover (i) rehabilitation and reconstruction of about 230 circuit-kilometers (cct-km) of 220 kV transmission lines and about 50 cct-km of 110 kV transmission lines; (ii) reconstruction of Khulum and Pule Khumri 220/110 kV substations, (iii) reconstruction of distribution substations; (iv) reconstruction of junctions; (v) supply and installation of 75 distribution transformers and 30,000 single-phase energy meters; (vi) rehabilitation and reconstruction of about 230 cct-km of medium voltage overhead conductors and poles, about 30 cct-km of medium voltage cables, about 210 cct-km of low voltage aerial bundled conductors, and about 35 cct-km of low voltage cables; (vii) supply of testing equipment and tools; (viii) computerized billing and revenue collection, including 50 data loggers; (ix) setting up an interim load dispatch center for monitoring the Kabul power system based on satellite communication to facilitate demand and supply management; and (x) development of a geographic information system to improve asset and customer management.

D. Cost Estimates

7. The total cost of the Power Infrastructure Component is estimated at \$35.97 million equivalent as summarized in Table A4.1.

³ The price will be negotiated later for future years.

⁴ ADB. 2002. Report and Recommendation of the President to the Board of Directors on a proposed Loan to Afghanistan for a Postconflict Multisectoral Program. Manila.

Table A4.1: Cost Estimates
(\$ million)

Item	Foreign Exchange	Local Currency	Total Cost
Equipment and Materials	26.26	3.14	29.40
Consulting Services	0.50	0.10	0.60
Physical and Price Contingencies	2.74	0.33	3.07
Interest During Grace Period	2.57	0.33	2.90
Total	32.07	3.90	35.97

E. Implementation Arrangements

8. MWP will be the implementing agency for the power component of the Project. A project implementation unit (PIU) under a project director will be established by MWP to oversee implementation. The project director will be responsible, inter alia, for overall management, coordination, and monitoring; audit of project accounts and financial statements; and preparation of progress reports. The PIU will function under the overall supervision and guidance of the project steering committee under the Ministry of Finance. The Procurement Unit of the Afghan Assistance Coordination Authority (AACA) will undertake all procurement of goods and services through its international procurement advisor. MWP will execute and administer the contracts through the PIU established to oversee project implementation.

F. Consulting Services

9. The PIU will be assisted by a firm of international project implementation consultants reporting to the project director. The consultants will be responsible for detailed design and engineering, preparation of detailed technical specifications and bid documents, project implementation supervision, and quality assurance. It is estimated that the services of about 15 person-months of international and 30 person-months of domestic consultants will be required.

10. The tasks of the project implementation consultants will include, but not be limited to, the following:

- (i) undertake field surveys of the northern transmission and Kabul distribution systems to determine their actual condition and extent of damage;
- (ii) ensure that the construction works will be carried out in accordance with environmentally sound standards and that the mitigation measures described in the Initial Environmental Examination are implemented;
- (iii) prepare detailed project report for rehabilitation and reconstruction of the northern transmission and Kabul distribution systems, taking into account the work already undertaken by Kreditanstalt für Wiederaufbau, the European Commission, and the World Bank-assisted Emergency Infrastructure Rehabilitation Project;
- (iv) prepare a comprehensive project management plan;

- (v) prepare specifications and assist MWP and AACA in preparing bid documents, evaluating technical and financial bids, and conducting negotiations for conclusion of contracts;
- (vi) supervise the delivery, construction, and erection of power component rehabilitation;
- (vii) supervise tests and commissioning of turnkey contracts;
- (viii) prepare inception, progress, bid evaluation, and other reports; and
- (ix) prepare the project completion report in accordance with ADB requirements.

G. Contract Packages

11. The planned contract packages are indicated in Table A4. 2.

Table A4.2: Contract Packages

No.	Packages	Contract Type	Mode	Estimated Value \$ million
1.	Khulum and Pule Khumri Substations and Transmission Line Rehabilitation ⁵	turnkey	ICB	19.90
2.	Kabul Distribution Rehabilitation and Reconstruction ⁵	turnkey	ICB	7.00
3.	Geographic Information System for Asset Management	turnkey	IS	0.50
4.	Hardware and Software for Distribution System Analysis	turnkey	IS	0.15
5.	Computerization of Billing including 50 Meter Data Loggers	turnkey	IS	0.50
6.	Cable Testing Vans (2), Testing Equipment, and Tools	turnkey	IS	0.50
7.	Satellite Communication System including Hub	turnkey	IS	0.40
8.	Hardware and Software for Kabul Load Dispatch Center	turnkey	IS	0.25
9.	Batteries (220 volt) for Substations and Power Stations	turnkey	IS	0.20
10.	Consultancy Services	services	QCBS	0.60

ICB = international competitive bidding, IS = international shopping, QCBS = quality cost-based selection.

H. Operation and Maintenance

12. DA Afghanistan Brishna Moassesa (DABM), constituted under a Special Act, is responsible for the operation and maintenance (O&M) of generation, transmission, and distribution of electricity in Afghanistan. A president, who reports to the professional Deputy Minister of MWP, heads DABM. DABM has about 5,200 staff, but they lack computers, modern communication equipment, and training in best practices. During the conflict period, proper maintenance and repairs could not be carried out on the power generation, transmission, and distribution systems. This has been exacerbated by the non-availability of spares, tools, testing equipment, and vehicles. Staff morale and productivity are low. Consultants engaged under the

⁵ See detailed cost breakdown in Table A4.3.

ADB-assisted Capacity Building Technical Assistance cluster⁶ have since August 2002 been working closely with MWP and DABM counterparts to strengthen MWP capacity in project planning, design, and management; and DABM capacity in asset management, load dispatching, accounting, billing, revenue collection, and O&M. Under the Project, they will receive suitable training from turnkey contractors as well as tools, equipment, and spare parts to effectively operate and maintain the integrated northern power system and Kabul distribution power system. The financial analysis (Appendix 13) shows that tariff levels have to be increased significantly in order for the Kabul distribution to be financially sustainable. In lieu of the needed tariff increase, the Government has to provide financing from its fiscal budget to subsidize the power subsector so that adequate O&M can be carried out.

**Table A4.3: Power Infrastructure Component
Detailed Cost Estimates for Contract Packages**

(\$ million)					
No.	Item	Quantity	Foreign Exchange	Local Currency	Total Cost
1. Transmission Rehabilitation and Reconstruction			17.89	2.01	19.90
	220 kV Hairatan - Khulum Transmission Line	70 cct-km	3.24	0.36	3.60
	220 kV Khulum - Pule Khumri Transmission Line	160 cct-km	7.55	0.80	8.35
	110 kV Khulum - Mazar Sharif Transmission Line	50 cct-km	1.40	0.15	1.55
	220/110 kV Khulum Substation	lot	2.60	0.25	2.85
	220/110 kV Pule Khumri Substation	lot	3.10	0.45	3.55
2. Kabul Distribution Rehabilitation and Reconstruction			6.04	0.96	7.00
	MV Overhead Conductors and Poles	230 cct-km	2.45	0.40	2.85
	MV Cables	30 cct-km	0.55	0.10	0.65
	LV Aerial Bundled Conductors	210 cct-km	1.15	0.10	1.25
	LV Cables	35 cct-km	0.25	0.05	0.30
	Distribution Transformers	75 units	0.75	0.15	0.90
	Single Phase Energy Meters	30,000 units	0.90	0.15	1.05

cct-km - circuit - kilometers, kV - kilovolt, LV - low voltage, MV - medium voltage

⁶ ADB. 2002. Technical Assistance to Afghanistan for Capacity Building for Reconstruction and Rehabilitation (Component 3D: Capacity Building and Training of Ministry of Water and Power and Component 3E: Study for Power Interconnection for Regional Trade). Manila.

GAS INFRASTRUCTURE

A. Rationale

1. The Project component is consistent with the Asian Development Bank's policy on rehabilitation assistance after disasters, as it is the least-cost solution for the restoration of gas infrastructure.¹ The most important indigenous primary energy resource in Afghanistan is natural gas. The infrastructure of the gas sector is in a state of decline, caused by a combination of factors that include the direct effects of the wars that the country has undergone, the shortage of expertise, and unavailability of spare parts and equipment due to lack of funding. The gas production, transmission, and distribution systems have severe operating problems and are in urgent need of rehabilitation. Gas availability is grossly inadequate to meet the current requirements mainly due to loss of production facilities and high rate of leakage. The gas leakage is not only a loss of revenue but also a major safety hazard.

2. The immediate problems facing the gas subsector in Afghanistan relate to (i) lack of equipment, spare parts and materials to maintain integrity of operations; (ii) inadequate resources for repairs and rehabilitation of production wells, gas processing plant, and transmission and distribution pipelines; (iii) lack of expertise in geological and geophysical assessment of gas fields including gas field management and reservoir depletion; and (iv) absence of corrosion prevention and cathodic protection of gathering mains and of the transmission and distribution network. Eight gas fields have been discovered in the northern part of the country, of which three have been developed. Gas production commenced in 1967. In the earlier years, most of the country's gas was exported to the Soviet Union. The export of gas terminated in 1987 with the end of Soviet domination in Afghanistan.

3. For domestic consumption of gas, transmission pipelines were built from Shebarghan to Mazar-e Sharif, located at a distance of about 135 kilometers. The consumers of natural gas in the two cities and smaller towns and villages in the vicinity of the transmission lines were connected through distribution pipelines. The present network serves a fertilizer plant; a gas fired thermal power plant with a total capacity of 48 Megawatts at the fertilizer factory site; the commercial sector such as bakeries, textile factory, food processing plant, etc., and domestic consumers for heating and cooking. Present gas production is less than one fourth of the level produced in the early 1980s.

4. The entity responsible for gas production, transmission, and distribution (Afghan Gas) urgently needs modern technology related to field depletion and reservoir management. The reservoir pressures have decreased significantly, and a large number of production wells have been shut down. Some of the nonproducing wells have to be worked-over to enhance production and to prolong the life of the fields. Gas availability is inadequate to meet current demand due to loss of production facilities and high rate of leakage; 30% of the gas currently produced leaks to the atmosphere, as several transmission and distribution pipelines have corroded. There is no cathodic protection system installed, which leaves buried pipelines exposed to corrosion. In many places gas pipelines have been constructed without adhering to safety standards and industry good practices. The transmission and distribution systems will have to be rehabilitated and upgraded. Condensates and other pollutant effluents are presently being discharged in areas adjacent to the gas transmission lines which poses health hazards for which mitigation measures are urgently required.

¹ Based on the findings of Technical Assistance Cluster 3874- AFG: Capacity Building for Reconstruction and Development for \$14.5 million, which included oil and gas sector among others

5. It is proposed to increase the availability of gas by rehabilitation of wells, upgrading of production facilities, and repair and rehabilitation of transmission and distribution pipelines. The proposed Project will optimize the use of indigenous natural gas and reduce dependence on petroleum fuel. The increased supply of natural gas will also help curtail the demand for fuel wood, thereby reducing deforestation. Fuel wood accounts for about 75% of total energy supplies, and constitutes the basic source of energy for cooking and heating in rural areas, where the majority of the population live. Long-term sustainability requires promoting the development of natural gas resources on a least-cost basis in an environmentally sound and socially acceptable way. There is an immediate need for external assistance in the rehabilitation of the current infrastructure facilities and in the further development of the sector. The project components will enhance environmental and safety standards, reduce ecological problems, and promote efficiency of natural gas use. In light of the above, the Government has given high priority to the rehabilitation and development of natural gas as a significant source of energy in the country.

B. Objectives and Scope

6. The main objective of this project component is to increase indigenous natural gas production, transmission, and distribution capability by rehabilitating and repairing the integrated gas supply and distribution system while enhancing environmental and safety standards, promoting improved efficiency of natural gas use, and strengthening the institutional capabilities of Afghan Gas for the future development of the gas sector.

7. The gas infrastructure in the country is poorly managed, mainly due to the shutdown of a number of production wells, closure of gas processing facilities, and high rate of gas losses from the transmission and distribution network. There is lack of geological and geophysical expertise in the country, which urgently needed to establish the gas field management strategy and to determine the optimum field depletion policy as reservoir pressures have decreased significantly. The scope of work will encompass a wide range of rehabilitation activities. The producing gas fields need to be rehabilitated to enhance gas production and to prolong the life of the fields. Some of the nonproducing wells have to be worked over, and the wells that were uncompleted need to be reevaluated. The quality of gas from some of the wells is not suitable as feedstock for fertilizer production due to the high hydrogen sulfide content in particular gas bearing zones. A skid-mounted gas processing plant needs to be installed for hydrogen sulfide removal, as rehabilitation of the present plant is not cost effective. Gas losses due to pipeline leakage are a major safety hazard in addition to a colossal loss of revenue, because the transmission and distribution pipelines have severe corrosion problems and need to be partly replaced or repaired to eliminate leak. A cathodic protection system needs to be installed for the buried pipelines to safeguard against corrosion. The pipeline capacity has been reduced as a lot of condensate has accumulated due to lack of dew point depression. Therefore, pigging facilities need to be installed to clean the pipelines internally.

C. Components and Output

8. The project component comprises (i) provision for two mobile rigs to carry out work over activities for 12 gas wells; (ii) provision for two complete well wire line units to carry out down-hole flow tests; (iii) supply and installation of one skid-mounted gas sweetening plant; (iv) two containerized gas production testing laboratories; (v) repair and reconstruction of corroded gas transmission lines including installation of pigging facilities and condensate disposal arrangements; (vi) repair and reconstruction of corroded gas distribution lines including installation of city gate stations; (vii) cathodic protection system for corrosion mitigation of

transmission and distribution pipelines; (viii) chemicals, tools, equipment, spare parts, instrumentation, piping and assemblies, and vehicles; (ix) consulting services for design, engineering, project management, and construction supervision; (x) contracting services for gas wells rehabilitation, and repairs and reconstruction of gas transmission and distribution facilities; and (xi) institutional strengthening and training of Afghan Gas.

D. Cost Estimates

9. The total cost of this component is estimated at \$24.07 million as summarized in Table A5.1.

Table A5.1: Cost Estimates²
(\$ million)

Item	Foreign Exchange	Local Currency	Total Cost
Gas Field Rehabilitation	8.12	0.73	8.85
Transmission & Distribution Rehabilitation	5.50	1.00	6.50
Equipment and Materials	4.00	0.00	4.00
Consulting Services	0.30	0.05	0.35
Training	0.20	0.20	0.40
Physical and Price Contingencies	1.86	0.20	2.06
Interest During Grace Period	1.72	0.19	1.91
Total	21.70	2.37	24.07

E. Implementation Arrangements

10. The Ministry of Mines and Industries (MMI) will be the implementing agency (IA) for the power component of the project. A project implementation unit (PIU) under a project director will be established by MMI to oversee implementation. The project director will be responsible, inter alia, for overall management, coordination, and monitoring; audit of project accounts and financial statements; and preparation of progress reports. The PIU will function under the overall supervision and guidance of the project steering committee under the Ministry of Finance. The Procurement Unit of the Afghan Assistance Coordination Authority (AACA) will undertake all procurement of goods and services through its international procurement advisor. MMI will execute and administer the contracts through the PIU established to oversee project implementation.

F. Consulting Services

11. International consultants will be appointed to prepare bid documents and to assist in the selection of turnkey contractors for rehabilitation of gas fields and upstream facilities and transmission and distribution systems. The consultants will review the contractors' proposals for rehabilitation works and will provide recommendations to the IA. The consultants will also carry out construction supervision, ensure quality control, supervise commissioning of the project

² See detailed cost breakdown in Table A5.3.

facilities, and issue completion certificates. It is estimated that 15 person-months of international consultants and 20 person-months of domestic consultants will be required.

G. Contract Services

12. There will be two turnkey construction contracts, one for gas field rehabilitation and the other for transmission and distribution system rehabilitation. The turnkey contractors will be responsible for detailed damage assessment, design and engineering, preparation of technical specifications, repairs, reconstruction and rehabilitation, and project management. The line pipes needed for the rehabilitation of the transmission and distribution system will be directly procured by the IA through AACA.

13. The broad task of the turnkey contractors will include the following:

- (i) support the task force under MMI in overall planning and sequencing of Project implementation activities;
- (ii) undertake design and engineering of pipeline transmission and distribution rehabilitation;
- (iii) establish the expertise and equipment needed for the gas field rehabilitation;
- (iv) prepare detailed specifications for machinery, equipment, and materials, and arrange procurement after approval;
- (v) monitor Project implementation, set up milestones, and prepare progress reports;
- (vi) carry out repair, reconstruction, and rehabilitation works;
- (vii) prepare a waste management plan including monitoring of the disposal of hazardous and toxic wastes, and ensure that the mitigation measures described in the Initial Environmental Examination are implemented; and
- (viii) provide on-the-job training to Afghan Gas in operation and maintenance of the rehabilitated system, and develop an external training program.

H. Contract Packages

14. The major contract packages under the project component are as shown in Table A5.2

Table A5.2: Contract Packages

Item	Contract Type	Contract Mode	Estimated Value (\$ million)
Repair and Rehabilitation of Operating Gas Fields	turnkey	ICB	8.85
Repair and Rehabilitation of Transmission and Distribution System	turnkey	ICB	6.50
Line Pipes	supply	ICB	4.00

ICB = International Competitive Bidding.

I. Operation and Maintenance

15. The gas infrastructure facilities reconstructed under the Project will be operated and maintained by Afghan Gas during and after completion of the works. Afghan Gas has a complement of staff both for the gas field operations and for the transmission and distribution functions comprising about 1100 employees. They will receive suitable training under the Project and will be provided with tools, equipment, and spare parts to effectively operate and maintain the integrated system.

Table A5.3: Detailed Cost Estimates
(\$ million)

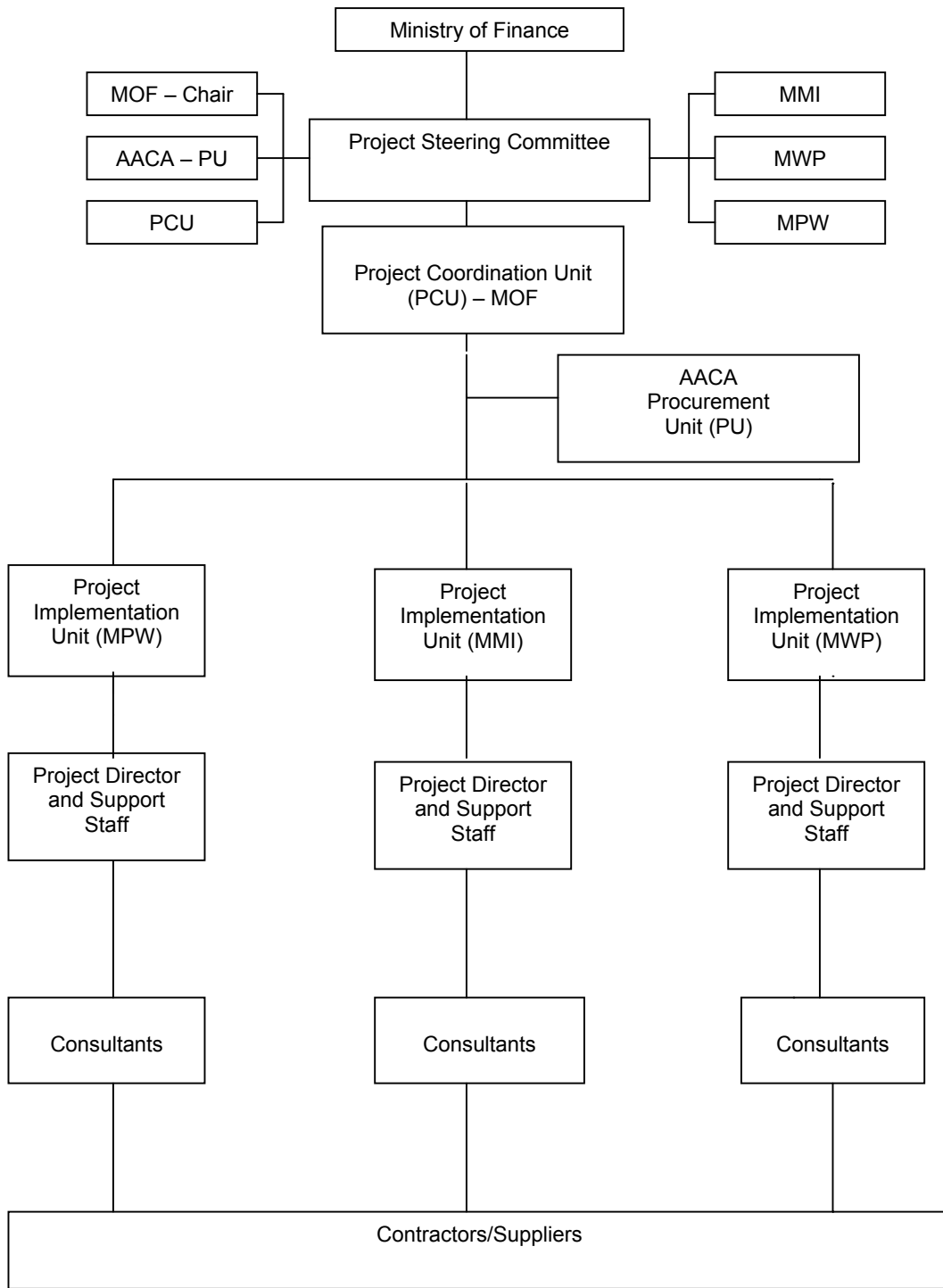
Component	FC	LC	Total
A. Gas Field Rehabilitation Component			
(i) Mobile well work-over rigs complete (2)	1.56	-	1.56
(ii) Well wire-line units complete (2)	0.30	-	0.30
(iii) Truck complete for well circulation (1)	0.10	-	0.10
(iv) Truck complete for well cementing (1)	0.10	-	0.10
(v) Materials for well work-over operations (tubing, chemicals etc.)	0.15	-	0.15
(vi) Containerized production testing laboratory (2)	0.30	-	0.30
(vii) Skid-mounted gas sweetening unit (1)	2.50	-	2.50
(viii) Instrumentation for producing wells and parts for gas separators	0.45	-	0.45
(ix) Tools and equipment for gas fields O & M	0.08	-	0.08
(x) Spare parts for wellhead, flow line and plant piping	0.10	-	0.10
(xi) Vans equipped with tools for well and plant repairs (6)	0.12	-	0.12
(xii) Assemblies for down-hole well completion (5 sets)	0.45	-	0.45
(xiii) Vehicles, mobile cranes, fire truck	0.33	-	0.33
Subtotal (A)	6.54	-	6.54
B. Gas Transmission and Distribution Component			
(i) Line pipes	4.00	-	4.00
(ii) Wrapping and coating materials	1.03	-	1.03
(iii) Pipeline fittings and valves	0.60	-	0.60
(iv) Cathodic Protection	0.35	-	0.35
(v) Flow computers for gas dispatch	0.15	-	0.15
(vi) Welding machines & electrodes	0.35	-	0.35
(vii) Pigging facilities	0.47	-	0.47
(viii) Condensate removal facilities	0.18	-	0.18
(ix) Tools and equipment for pipeline O & M	0.27	-	0.27
(x) Vehicles for transmission/distribution lines maintenance	0.44	-	0.44
(xi) Pipeline safety equipment	0.15	-	0.15
(xii) Metering skid, regulators, filters, and city gate stations	0.14	-	0.14
Subtotal (B)	8.13	-	8.13
C. Consulting Services for construction supervision and quality Assurance	0.25	0.05	0.30
D. 1. Turnkey contract services for work-over of non-producing wells	1.70	0.90	2.60
2. Turnkey contract services for pipelines repairs and rehabilitation	1.50	1.03	2.53
E. Training	0.20	0.20	0.40
Subtotal (C, D, and E)	3.65	2.18	5.83
F. Other Costs	3.38	0.19	3.57
Total Cost	21.70	2.37	24.07

SUMMARY OF COST ESTIMATE
(\$ million)

Item	Rehabilitation of Infrastructure						Total		
	Roads		Power		Gas		FX	LC	Total
	FX	LC	FX	LC	FX	LC			
A. Civil Works	55.09	13.77	0.00	0.00	0.00	0.00	55.09	13.77	68.86
B. Equipment and Materials	0.00	0.00	26.26	3.14	4.00	0.00	30.26	3.14	33.40
C. Gas Field Rehabilitation	0.00	0.00	0.00	0.00	8.12	0.73	8.12	0.73	8.85
D. Gas Transmission/Distribution Rehabilitation	0.00	0.00	0.00	0.00	5.50	1.00	5.50	1.00	6.50
E. Consulting Services	4.24	0.29	0.50	0.10	0.30	0.05	5.04	0.44	5.48
F. Incremental Administrative Support (including training)	1.31	0.29	0.00	0.00	0.20	0.20	1.51	0.49	2.00
Subtotal	60.64	14.35	26.76	3.24	18.12	1.98	105.52	19.57	125.09
Contingencies									
<i>Physical (5%)</i>	3.03	0.72	1.34	0.16	0.91	0.10	5.28	0.98	6.26
<i>Price (5%)</i>	3.18	0.75	1.40	0.17	0.95	0.10	5.53	1.02	6.55
Interest During Grace Period	5.89	1.40	2.57	0.33	1.72	0.19	10.18	1.92	12.10
Total	72.74	17.22	32.07	3.90	21.70	2.37	126.51	23.49	150.00
	89.96		35.97		24.07				

FX = foreign exchange, LC = local currency.

IMPLEMENTATION ARRANGEMENTS



AACA=Afghan Assistance Coordination Authority, MMI=Ministry of Mines and Industry, MOC=Ministry of Commerce, MOF=Ministry of Finance, MPW=Ministry of Public Works, MWP=Ministry of Water and Power, PCU=Project Coordination Unit, PMU=Project Management Unit, PU=Procurement Unit

IMPLEMENTATION SCHEDULE

Activity	2003				2004				2005				2006	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
PART A : ROAD INFRASTRUCTURE														
Prequalification of Contractors		■	■	■										
Appoint Consultant		■	■											
Preparation of Design and Build Bidding Documents		■	■	■										
Bidding for Design and Build Contracts				■	■	■								
Award Design and Build Contracts					■	■								
Mobilization and Design					■	■	■							
Construction							■	■	■	■	■	■	■	■
PART B : POWER INFRASTRUCTURE														
Appoint Consultants		■	■	■										
Preparation of Bidding Documents				■	■	■								
Bidding for Design, Supply, and Installation Contracts					■	■	■							
Award Design, Supply, and Installation Contracts						■	■							
Mobilization, Delivery, and Installation							■	■	■	■	■	■	■	■
Commissioning														■

Activity	2003				2004				2005				2006	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
PART C : GAS PRODUCTION AND DISTRIBUTION INFRASTRUCTURE														
Appoint Consultant		■	■	■										
Preparation of Bidding Documents			■	■										
Bidding for Design, Supply, and Installation Contracts				■	■	■								
Award Design, Supply, and Installation Contracts						■	■							
Procurement of Line Pipes						■	■	■	■					
Mobilization, Delivery, and Installation							■	■	■	■	■	■	■	■
Commissioning													■	■

CONTRACT PACKAGES

No.	Description	Contract Type	Mode	Estimated Value (\$ million)
Road				
RC1	Rehabilitation of Road from Pule Khumri – Mazar Sharif and international Link Road from Naibabad – Hairatan (Uzbekistan)	design-build	ICB	29.50
RC2	Rehabilitation of Road from Mazar Sharif – Sheberghan – Andkhoy	design-build	ICB	47.00
Power				
PC1	Khulum and Pule Khumri Substations and Transmission Line Rehabilitation	turnkey	ICB	19.90
PC2	Kabul Distribution Rehabilitation and Reconstruction	turnkey	ICB	7.00
PC3	Geographic Information System for Asset Management	turnkey	IS	0.50
PC4	Hardware and Software for Distribution System Analysis	turnkey	IS	0.15
PC5	Computerization of Billing including 50 Data Loggers	turnkey	IS	0.50
PC6	Cable Testing Vans (2), Testing Equipment and Tools	turnkey	IS	0.50
PC7	Satellite Communication System including Hub	turnkey	IS	0.40
PC8	Hardware and Software for Kabul Load Dispatch Center	turnkey	IS	0.25
PC9	Batteries (220/V) for Substations and Power Stations	supply	IS	0.20
Gas				
GC1	Repair and Rehabilitation of Operating Gas Fields	turnkey	ICB	8.85
GC2	Repair and Rehabilitation of Transmission and Distribution System	turnkey	ICB	6.50
GC3	Line Pipes	supply	ICB	4.00

ICB = International Competitive Bidding, IS = International Shopping

SOCIAL SCREENING FRAMEWORK

A. Introduction

1. The Emergency Infrastructure Rehabilitation and Reconstruction Project involves reconstruction and rehabilitation of key infrastructure in transport and energy sectors: (i) rehabilitation of the 471 km of the national road network (Pule Khumri - Mazar Sharif - Sheberghan – Andkhoy section of the ring road) including the international link to Uzbekistan (Naibabad – Hairatan section); (ii) power infrastructure component — urgently needed reconstruction and rehabilitation of transmission lines in the northern provinces and Kabul distribution system; and (iii) gas infrastructure component – urgently needed repairs and rehabilitation of gas production, transmission and distribution facilities. The poverty and social analysis has been prepared following the Asian Development Bank's *Handbook for Poverty and Social Analysis* (2001).

2. This Social Screening Framework was prepared for the Project as required under ADB's social safeguard policy. The Framework outlines the policy and procedures for preparation of project components, which require mitigation measures in particular related to land acquisition. The implementing agencies (IA's) will be responsible for preparing social screening plans (SSP's) for subprojects as outlined in this framework and will submit the same to the Executing Agency (EA) and ADB for review and approval.

B. Social Screening Framework

3. ADB policy requires (i) preparation of social assessment; (ii) avoiding or minimizing impacts where possible; (iii) consultation with beneficiaries and affected people in project planning and implementation, including disclosure of Project-related information; (iv) payment of compensation for acquired assets at the market/replacement value; (v) assistance to affected people, including nontitled persons (e.g., informal dwellers/squatters, and encroachers); (vi) special attention to vulnerable people and groups; and (vii) income restoration and rehabilitation program according to ADB's policies on *Involuntary Resettlement (mcmxcv)* and *Indigenous People (mcmxcviii)*, as amended from time to time.

C. Procedures for Preparing Social Screening Plans

4. The SSP for each component will be prepared as follows: The IA concerned with the assistance of the consultant for the road component will carry out social impact assessment surveys for identified project components, based on preliminary technical designs; in case of adverse impact on affected persons, IA's will prepare an SSP for each component, with the assistance of the screening and monitoring consultant, for submission to ADB.

5. The EA will ensure that the consultant responsible for resettlement plan (RP) preparation is aware of the framework and procedures for social assessment and resettlement planning so that appropriate entitlements and mitigation measures are established in the RP. The EA and IA's will further ensure that resettlement budgets are delivered on time to the local office for timely RP implementation. The consultants will assist the IA's in the following: (i) conducting census, socioeconomic survey, and asset inventory work to identify impacts and options; (ii) preparing an entitlement matrix; (iii) conducting consultation and participation procedures with all stakeholders, especially the people affected by planning and management; (iv) preparing specific measures to improve the status and incomes of the poor and vulnerable groups; (v) preparing a detailed budget and implementation schedules; (vi) making management

arrangements; and (vii) preparing arrangements for internal and independent monitoring and evaluation.

D. Institutional Responsibilities

6. For subprojects that require a SSP, the EA will have overall coordination, planning, implementation, and financing responsibilities. An IA staff member will be appointed as social development officer to supervise the implementation work. The EA will ensure that the IA responsible for SSP preparation for subprojects is aware of the framework and procedures for SSP planning so that appropriate mitigation measures are established in the SSP.

E. Consultation and Disclosure

7. Consultation and disclosure requirements will be simplified, taking into consideration the uncertain security situation. Each SSP will be prepared and implemented in close consultation with the stakeholders, particularly with the Project-affected people. The SSP will be discussed during meetings at the village/community level.

F. Monitoring and Evaluation

8. The EA will establish a quarterly monitoring system involving itself and the IA's and will prepare progress reports on all aspects of land acquisition and social development activities. The screening and monitoring consultants will monitor the implementation of the SSP's and will report to ADB on the progress of SSP implementation in quarterly progress reports, including fulfillment of the safeguard measures.

SUMMARY POVERTY REDUCTION AND SOCIAL DEVELOPMENT STRATEGY

A. Linkages to the Country Poverty Analysis			
Sector identified as a National Priority in Country Poverty Analysis?	Yes	Sector identified as a National Priority in Country Poverty Partnership Agreement?	No PPA yet
<p>Contribution of the sector/subsector to reduce poverty in Afghanistan.</p> <p>Much of Afghanistan’s infrastructure was destroyed and damaged during 20 years of war. War also prevented new investments from taking place. Reestablishing and restoring essential infrastructure, particularly the road network and power and gas supplies is critical for the revival and resumption of economic activities, which would contribute to employment creation, income generation, rehabilitation of displaced populations and ex-combatants, improvement of security and stability, inter-ethnic reconciliation, and political unification of the country. The poor, who constitute the majority of Afghan’s population, will benefit directly through job opportunities for unskilled and semiskilled laborers during the reconstruction of infrastructure facilities. Furthermore, the Project will also provide social and economic opportunity to the beneficiaries, particularly the poor, that will help to reduce poverty.</p> <p>The Project will contribute to economic recovery, diversification of activities, employment generation, higher productivity, improved per capita income, increased revenue generation, improved efficiency and effectiveness of the public sector, private sector development, environmental preservation, and social stability. Specific beneficiaries will include the rural and urban poor, displaced populations, demobilized combatants, and women. Specifically, the benefits will be directly or indirectly attributable to different project components. Energy development will (i) improve energy – gas and electricity supply in terms of quantity, quality, stability, safety, and environmental impact; (ii) improve household quality of life; (iii) revive industries and establish new ones; (iv) contribute to energy security and self-reliance; (v) promote private sector activities including those owned and operated by women; and (vi) improve electricity supply to Kabul, which is the political and economic hub of the country; (vii) make natural gas available where demand exists and also for stimulating demand for gas away from alternative sources such as fuel wood, and imported oil; and (viii) make gas supply safe, avoiding the present problem of leakage. Production from manufacturing industries will increase substantially due to improved supply of power, oil, and gas, especially in and around major urban locations such as Kabul, Kunduz, Mazar Sharif, Pule Khumri, and Sheberghan. The output of service establishments will get a boost from the improved energy supply. Tariff collection will increase, improving the financial viability of power and gas distribution; the Government subsidy can be reduced or eliminated; and revenue from taxes will go up. Indigenous gas will save foreign exchange currently used to import energy. Increased and secure power supply will encourage private sector investments in all sectors, particularly manufacturing, commerce, and services. Improved power supply will improve the supply of safe water and the quality of health services. Improvement in health care delivery will bring down maternal mortality. The Project will optimize the use of natural gas and curtail the demand for fuel wood, thereby saving forests.</p> <p>Road transport development will (i) improve the national road network; (ii) improve the maintenance of roads; (iii) facilitate the movement of humanitarian aid through the northern corridor; (iv) reduce the cost of transportation; (v) promote international and regional trade; (vi) increase the income of vulnerable groups in rural and urban areas; (vii) build up the capacity of local contractors for construction, rehabilitation, and maintenance of major roads and bridges; and (viii) promote environmental preservation. Production from manufacturing industries—small, medium, and large—will increase substantially due to improved supply of machinery, equipment, and materials and to better marketing prospects. Toll collection will increase, and Government tax revenue will go up from income, corporate, and trade taxes. Road rehabilitation and</p>			

reconstruction will open up a wide range of opportunities for the private sector involved in road construction, production, trade, transport, and services. Rehabilitated roads will improve the supply of and access to health services. The road component will assist some of the most vulnerable groups in the country in their repatriation, resettlement, and reintegration within their communities; provide livelihood and develop the capacity and skills that provide sustainability. Women's welfare will be promoted through improved availability and access to social services, including education and health. Private sector development will open up opportunities for women entrepreneurs.

B. Poverty Analysis

Proposed Classification: Poverty Intervention

Afghanistan is one of the poorest countries in the world, with an estimated 2002 population of 27.8 million. Poverty has worsened over the past two decades, with an estimated 60–80% of the population living below the threshold of \$1 a day¹ or consuming below the Food and Agriculture Organization requirement of 2,453 kilocalories; 70% of the Afghan population is malnourished, and only 13% have access to improved water resources. Six million Afghans are vulnerable, include small farmers, landless laborers, ex-combatants, war widows, war orphans, debtors, sharecroppers, returning refugees, internally displaced persons (1.1 million), the abandoned, and the disabled (800,000, of whom 200,000 are mine victims) – in need of basic food items, medical supplies, clean drinking water, etc. Nonmaterial poverty as reflected in physical and social insecurity; isolation; marginalization; alienation; and ethnic, religious, and gender discrimination further pushes many Afghans deeper down the poverty ladder.²

Two decades of war have prevented any progress that might otherwise have occurred, and on the contrary have made the situation worse. In 1996, Afghanistan ranked 169th (of 174 countries) in the UN Human Development Index. Access to education in Afghanistan is limited, and the quality of the education is very poor. The primary gross enrolment rate has been most recently estimated at 39% for boys and 3% for girls. The situation in health is equally grim. According to the World Bank report (2002),³ infant mortality is estimated to be one of the highest in the world at around 165 per 1,000 live births, while 257 of every 1,000 live births die before they are five. The maternal mortality rate is estimated to be 1,700 per 100,000 live births, and life expectancy at birth is estimated at around 41 years of age.

Afghanistan's economy was traditionally based mainly on agriculture and animal husbandry. Most recently, Afghanistan has been hit by a severe, protracted drought that started in 1999 and has lasted until the present. Crop production has been halved, and livestock herds are heavily depleted. Large and increasing numbers of people have lost their means of livelihood. The impact of the drought, which would have been serious under any circumstances, has been aggravated by the run-down condition of irrigation systems and other agricultural infrastructure. An estimated 4.3 million people will be facing food deficits in 2003 until the next harvest.⁴

By the mid-1990s most of the country's limited modern infrastructure – roads, bridges, irrigation, telecommunications, and electricity – had been damaged and destroyed, and traditional irrigation systems suffered greatly from destruction and lack of maintenance. This is particularly true for major national roads, and power generation, transmission and distribution infrastructure, and natural gas production and distribution infrastructure. In sum, Afghanistan's economic structure has been greatly weakened, distorted, and made more vulnerable through two decades of conflict and 4 years of drought. While no systematic poverty study is available, poverty is associated with low economic growth and the collapse of employment opportunities due to a long period of war.

¹ Reliable data on poverty indicators are not available. ADB. RRP: Afghanistan Post conflict Multisector Program. December 2002

² Afghanistan: 2002-2004 -Initial Country Strategy and Program. ADB.2002

³ World Bank. Afghanistan Facts and Figures at a Glance. April 2002.

⁴ Afghanistan Country Food Needs Assessment of Rural Settled Populations. World Food Program: WFP Vulnerability Analysis Mapping Unit and Partners. 2002 - 2003.

The project design was developed through stakeholder consultations. Community consultation will be carried out to determine selection priority including engineering solutions to exclude all resettlement impacts. Based on the technical requirements, opportunities for local communities, in particular displaced populations and ex-combatants, to work on the civil works such as earthworks will be incorporated.

C. Potential Issues

	Significant/ Not Significant/ Uncertain/ None	Strategy to Address Issues	Plan Required
Resettlement	None	The Project will not involve any land acquisition. The reconstruction and rehabilitation of infrastructure facilities will occur on existing rights-of-way only. The works will be designed, using engineering solutions, to ensure that reconstruction and rehabilitation will be within the existing rights-of-way.	None
Gender	None	Earthworks are a significant component of the civil works. The implementing agency of the road component will ensure that women and men are given equal opportunities for employment on the Project. Contractors will be required to ensure equal payment for equal work. These actions will be monitored by the supervision consultant.	A specific clause will be included in the bidding documents
Affordability	Not significant	The Project will have positive impact in reducing transport cost and the impact of improved infrastructure facilities, particularly electricity, on the affordability of consumers will be monitored.	None
Labor	Not significant	Employment opportunities within the Project will be available on an equal basis to all, on the basis of professional competence, irrespective of gender, or ethnic or religious groups.	None
Indigenous People	None	No indigenous people and communities will be negatively affected by the Project.	None
Other Risks/ Vulnerabilities	None	The capacity of implementing agencies to address social dimensions, particularly social safeguard policies, is very inadequate. A cluster Technical Assistance for Capacity Building for Reconstruction and Development for Afghanistan was approved in 2002. One of its components is to strengthen key infrastructure agencies in ensuring social safeguard policies and incorporating social dimensions in the development of transport and energy sector projects.	None

ECONOMIC ANALYSIS

1. A preliminary economic analysis of the three components of the Project has been carried out. The findings and assumptions, summarized in the following paragraphs, suggest that investment in road and energy infrastructure is economically justified. However, the encouraging results are predicated upon certain assumptions regarding achievement of sector restructuring and policy reforms as anticipated under the Postconflict Multisector Program Loan leading to improvement of operational and administrative efficiency that will, among others, call for streamlining of tariff structure, accounting, billing and revenue collection, as appropriate. Adequate resources will be needed for operation and maintenance (O&M) of assets rehabilitated under the Project.

A. Road Infrastructure

2. An economic evaluation of the road rehabilitation component of the Project has been carried out that weighs the savings in vehicle operating costs (VOCs) and travel time costs gained by the Project against the initial investment costs and the savings in future periodic and routine maintenance costs over a 20-year period. In carrying out this evaluation, a maintenance strategy was adopted in the base case (without Project) scenario that assumed minimal periodic maintenance would be carried out. This reflects the current situation. Base year (2003) daily traffic data collected through 24-hour traffic counts on selected links show a vehicle count of 1505 for Pule Khumri to Naibabad Junction, 1716 for Naibabad Junction to Hairatan, 2819 for Naibabad Junction to Mazar Sharif, 2049 for Mazar Sharif to Sheberghan, and 639 for Sheberghan to Andkhoy. Traffic growth rates over the evaluation period were taken to match (Asian Development Bank) staff's estimates of Gross Domestic Product growth.¹

3. VOCs and travel time costs were calculated for seven types of vehicles² using Highway Design Model roughness – VOC and roughness – speed relationships. Based on various assumptions regarding occupancy, value of time per car is estimated at \$0.38 plus \$0.13 per passenger, going up to \$0.50 per truck plus \$0.25 per passenger (excluding crew members, whose time is valued in VOC). These values are derived from the average wage required to meet minimum food requirements for bus passengers and a premium over it for truck passengers. No allowance is made for nonwork-related travel. All calculations are done on the basis of normal traffic, (projected traffic that will occur both without or with the Project), excluding generated traffic which makes estimated economic returns on the conservative side. Lack of data did not permit consideration of accident cost savings, thereby further underestimating benefits.

4. A factor of 0.9 was used to convert financial construction and maintenance costs to economic costs. The economic evaluation³ indicates that the overall Project is economically viable, with an (Economic Internal Rate of Return) of 31.5% and a net present value (NPV) of \$167.5 million. Table A12.1 shows the EIRR and NPV of the project road, as well as its various sections.

¹ 9.7% (2003), 9.7% (2004), 7.8% (2005), 6.4% (2006 -2010), 5.4% (2011 - 2015), and 5.0% (2016 - 2025).

² Car, PU/4WD, minibus, large bus, medium truck, and heavy truck with distribution being 11.4%, 17.2%, 47.8%, 6.6%, 5.1%, and 11.9% obtained from traffic survey.

³ Contribution of travel-time savings to the benefit stream is less than 10%.

Table A12.1: Economic Analysis - Road Component

Road Link	EIRR (%)	NPV (\$ million)
Pule Khumri to Naubabad Junction	23.9	24.6
Naibabag Junction to Hairatan	41.5	20.7
Naibabad Junction to Mazar Sharif	49.9	27.9
Mazar Sharif to Sheberghan	35.8	84.6
Sheberghan to Andkhoy	19.2	9.7
Total Project	31.5	167.5

5. Sensitivity tests were carried out to investigate the robustness of the economic viability of the project component to cost overrun and reduction in benefits. The results of the sensitivity tests carried out on the total project component comprising all road links are summarized in Table A12.2. Sensitivity was also tested by decreasing benefits by 20 percent and increasing costs by 20 percent and both. These sensitivity tests demonstrate that the overall Project is very robust to variations in construction cost and benefits. Similarly reduction of traffic growth rates by 25 percent and 50 percent reduces EIRR to 29 percent and 26.5 percent respectively. These sensitivity tests demonstrate that the overall Project component is very robust to increase in construction cost, implementation delays and reduction in traffic growth.

Table A12.2: Sensitivity Analysis - Road Component

Sensitivity Test	EIRR (%)	NPV (\$ million)
Base Case	31.5	167.5
Benefits Decreased by 20%	26.5	122.7
Initial Construction Costs Increased by 20%	27.0	156.0
Benefits Decreased by 20% and Initial Construction Costs increased by 20%	23.5	110.2

B. Power Infrastructure

6. The DABM is (DABM) quasi-government enterprise in the power sector, and is responsible for O & M, of Afghanistan's power infrastructure. DABM is responsible for about 80% of the country's electricity production, with the Ministry of Mines and Industry accounting for the balance. System (technical and nontechnical) losses are estimated at 45% in the distribution system, and another 46% is estimated as commercial loss.

7. The economic analysis of power import options was carried out excluding revenues. Benefits attributed to the project were shares of the ADB's growth projections (low case) for the manufacturing and trade sectors. These "energy-dependent" shares consist of 25% projected growth to 2015 and 10% thereafter for the remainder of the 20-year operating period under assessment. The economic evaluation indicates that the overall project component is economically viable, with an EIRR of 32.2% and a NPV of \$414 million. Sensitivity tests were carried out to investigate the robustness of the project component to variations in the initial construction cost, resulting cost overrun, and variations in revenue benefits resulting from reduced collection and/or leakage in transmission and distribution. The results of the sensitivity tests carried out on the entire project component, summarized in Table A12.3, demonstrate that

the overall project component is very robust to variations in costs and benefits. A combined cost escalation of 20% and benefit reduction of 20% results in a decline of EIRR to 22.8%, still well within the acceptable range.

Table A12. 3: Sensitivity Analysis - Power Component

Sensitivity Test	EIRR (%)	NPV (\$ million)
Base Case	32.2	414.2
Benefits Decreased by 20%	26.8	278.0
Costs Increased by 20%	27.8	360.9
Benefits Decreased by 20% and Costs Increased by 20%	22.8	224.7

C. Gas Infrastructure

8. The economic analysis for the gas component was calculated on the basis of estimated capital costs of \$20.1 million divided equally between production and transmission. O&M costs are assumed to be 5% of total capital costs. Rehabilitation of existing pipeline and production wells appears to be the least-cost option compared with the drilling of new wells and/or building new pipeline. The economic benefits of rehabilitating transmission and distribution facilities consist of revenues from the sale of an additional 320,000 cubic meters per day. Additional supply is attributed to 250,000 cubic meters savings from losses and 70,000 cubic meters from new production. Revenue has been calculated at current tariff averages of \$12.13 per 1,000 cubic meters. End consumer tariff is \$10.87 for the fertilizer factory, \$16.74 for power plants, \$22.83 for commercial clients, and \$16.74 for domestic users. Prices are for 1,000 cubic meters. Collection rates are poor now. Future collection rates are put at 75% for the fertilizer plant, power plants, and commercial clients, and 50% for domestic users, giving an average collection rate of 69.1%. It is assumed that gas has to be supplied over 300 operating days a year, taking into account breakdown, shutdown of the fertilizer factory, and other consumers.

9. The economic evaluation indicates that the overall project component is economically viable, with an EIRR of 34.7% and a NPV of \$34.1 million. Sensitivity tests were carried out to investigate the robustness of the gas component of the Project to variations in the initial construction cost resulting cost overrun and variations in revenue benefits resulting from reduced collection and/or leakage in transmission and distribution. The results, summarized in Table A12.4, indicate that the overall project component is very robust to variations in costs and benefits. A combined cost escalation of 20% and benefit reduction of 20% results in a decline of EIRR to 23.4% and NPV to \$18.4 million, both still high compared with alternatives.

Table A12.4: Sensitivity Analysis - Gas Component

Sensitivity Test	EIRR (%)	NPV (\$ million)
Base Case	34.7	34.1
Benefits Decreased by 20%	28.1	22.8
Initial Construction Costs Increased by 20%	29.3	29.7
Benefits Decreased by 20% and Initial Construction Costs Increased by 20%	23.4	18.4

FINANCIAL ANALYSIS

1. For the purpose of working out the financial internal rates of return (FIRRs), the Project has been divided and individually analyzed into two segments: (i) gas sector rehabilitation, and (ii) power sector rehabilitation. The assumptions for the different segments are discussed in the following paragraphs. The rate of exchange has been assumed as \$1.00 = Afs46.

A. Power Infrastructure

2. Based on available information, the power supply is weak regarding reliable power generation as well as having damaged transmission and distribution systems. The technical losses in transmission are estimated at 5% and 20% in the Kabul distribution system at 20%. Due to the lack of a sufficient number of meters and of efficient administration for meter reading and billing, the nontechnical losses are currently estimated at 20%, making the total system losses in the distribution system as high as 45%. Collection efficiency is also extremely poor, 54%. The collection/generation ratio for Kabul is estimated at around 30% only. Restructuring and training efforts are essential to reduce the losses and thus the heavy burden on the government budget. These efforts have to be carried out simultaneously with a review of the current tariff structure to be able to achieve financial sustainability in the sector.

3. The financial evaluation of the Project was carried out in real terms and on an incremental basis by comparing “with Project” and “without Project” scenarios. The assumptions were as follows:

- (i) In the base case, the revenues were calculated at the current average tariff, 2.4 US cents/kilowatt-hour (kWh)
- (ii) The average generation cost, 0.9 US cents/kWh is based on hydropower at 0.5 US cents/kWh and, during the four winter months (6 hours/day), gas turbine generation at 13 US cents/kWh as additional supply.
- (iii) Based on the project investments, the technical and nontechnical losses in the Kabul distribution system are expected to be reduced from the current 45% to 30%.
- (iv) Operational, maintenance, and administration costs are estimated at 5% of the invested capital.
- (v) In achieving the estimated benefits, (a) investments funded by the World Bank, Kreditanstalt für Wiederaufbau, and the European Commission; (b) investments in the northern distribution system; and (c) investments in the remaining transmission link to Kabul are included in the capital cost (8, 20, 5 and 20 million US\$, respectively).

4. Based on existing tariffs, limited technical resources, as well as lack of accurate administration, DABM is currently not financially viable. To make this project component viable and at the same time bring DABM back to financial sustainability without heavy subsidies from the government budget, major restructuring efforts are needed. To reflect possible opportunities, two scenarios have been analyzed aside from the above presented base case:

- (i) Financial recovery is achieved solely through improved system losses in distribution (from 45% to 30%, equivalent to an expected collection/generation ratio of 38% compared with the current 30%) derived from the Project and increased tariffs from current average 2.4 US cents/kWh to 7.3 US cents/kWh to attain 15% FIRR for this Project.
- (ii) In attaining the same FIRR, 15%, the second scenario assumes major efforts in improving the administration of meter reading, billing, and collection to avoid too steep tariff increases. If the commercial losses can be brought down to 40% from the currently estimated at 46% (equivalent to a collection/generation ratio of 42%), the average tariff needed will instead be 6.5 US cents/kWh.

B. Gas Infrastructure

5. Based on available information, the gas supply is in very poor condition regarding both the gas fields and the transmission/distribution systems. The physical losses are estimated at 30%, mainly due to leaks in the transmission and distribution systems. Based on almost nonexistent collection, Afghan Gas is currently not a financially viable company. Major restructuring efforts are needed regarding operation; administration including accounting, billing, and revenue collection; as well as review of the current tariff structure to be able to bring the financial performance back to profitability.

6. The supply as well as the major customer groups are currently located in the northern part of the country as presented in Table A13.1.

Table A13.1: Gas Consumption and Tariffs

Gas Supply (CM/day)	Current Supply	Immediate Demand
Fertilizer Plants	300,000	440,000
Power Plants	60,000	60,000
Commercial	100,000	200,000
Domestic	120,000	200,000
Losses	250,000	-
Total	830,000	900,000

End Consumer Tariffs	Afs/1000cm	USD/1000CM
Fertilizer Plants	500	10.87
Power Plants	770	16.74
Commercial	1,050	22.83
Domestic	770	16.74
Average Tariff	557	12.13

7. The financial evaluation of the Project was carried out in real terms and on an incremental basis by comparing the “with Project” and “without Project” scenarios. The assumptions were as follows:

- (i) Revenue was calculated at current rates and volumes as presented by Afghan Gas.

- (ii) Collection rates are based on the assumption of restructured Afghan Gas, fully capable of metering, billing, and collecting (Table A13.2).

Table A13.2: Collection Rate

Consumer	Collection (%)
Fertilizer Plants	75
Power Plants	75
Commercial	75
Domestic	50
Total Collected Revenues	44.1%

- (iii) Costs for operation and maintenance of the gas fields, transmission and distribution pipelines, as well as administration, are assumed at 5% of the estimated project cost.
- (iv) No transmission and distribution losses were considered.

8. Based on existing tariffs, limited technical resources, as well as lack of accurate administration, Afghan Gas is currently not financially viable. To make this project component viable and at the same time bring Afghan Gas back to financial sustainability without heavy subsidies from the government budget, major restructuring efforts are needed to improve operational efficiency, reduce losses, and enhance collection. However, the major factor to achieve 14.9% FIRR is through a 3.65 times increase in existing tariffs,¹ which are extremely low, heavily subsidized, and unrealistic.

C. Conclusion

9. Based on the current total losses; technical, nontechnical and commercial in the power sector, this component is not financial viable. However, as this component will have major positive impact on the country's economy and is urgently needed, it is essential that the above-mentioned restructuring measures along with tariff restructuring are implemented. Without these measures, the Power Sector will continue to be a major burden on government resources. Table A13.3 shows the variations in financial viability/FIRR due to increases in tariff and reduction in distribution and commercial losses.

Table A13.3: Power Component

Item	Average Tariff (US cents/kWh)	Distribution Losses (%)	Commercial Losses (%)	FIRR (%)
Base Case (current tariff and losses)	2.4	45.0	46.0	neg.
Reduce Losses and Increase Tariff (1)	7.3	30.0	46.0	15.0
Reduce Losses and Increase Tariff (2)	6.5	30.0	40.0	14.9
Increased Tariff only	7.3	45.0	46.0	4.1
Increased Tariff and Minor Improvements in Losses	7.3	40.0	40.0	11.2
Reduce Losses and Vary in Tariffs (1)	5.0	30.0	40.0	neg.
Reduce Losses and Vary in Tariffs (2)	6.0	30.0	40.0	9.0

¹ The current average tariffs of Afs 557 or \$12.13 per 1000 cubic meters is increased to Afs2,035 or \$44.3 per 1000 cubic meters.

10. Given the present level of tariffs, which are significantly below the current market prices in neighboring countries, compounded by the poor collection rates, the gas sector component is not financially viable. Though the technical losses will be minimized through the proposed rehabilitation and reconstruction of the facilities, major improvements in collection rates and tariff rationalization are required. Table A13.4 shows the effect of tariff increases and reduction in commercial losses on FIRR.

Table A13.4: Gas Component

Item	Average Tariff (US cents/1000 cubic meters)	Commercial Losses Average (%)	FIRR (%)
Base Case (collection rate 75% for Industrial/Commercial & 50% for Domestic)	44.26	31.1	14.9
Collection Rate 60% for Industrial/Commercial & 40% for Domestic	44.26	44.9	6.5
Collection Rate 50% for Industrial/Commercial & 30% respectively	44.26	54.1	neg.
Collection Rate 50% & 25%	44.26	66.1	neg.
Improved Losses, Reduce Tariffs (1)	35.00	31.1	9.9
Improved Losses, Reduce Tariffs (2)	30.00	31.1	6.6
Improved Losses, Reduce Tariffs (3)	20.00	31.1	neg.

11. For the gas and power components, the Project includes capacity building efforts at the operational level that will improve operation and maintenance capacity of DABM and Afghan Gas. The Project-proposed enhancement in tariff, reduction of technical and nontechnical losses, and increase in collection rates are critical for financial sustainability of these institutions. Tables A13.3 and A13.4 demonstrate that financial viability could be achieved through a variety of measures. Major institutional improvements have a key role in achieving these objectives. It is recognized that full cost recovery will take time. However, the Government has shown deep commitment to pursue these efforts and has given specific targets for achieving institutional improvements and enhancing cost recovery during the recently concluded Afghanistan Development Forum.

SUMMARY INITIAL ENVIRONMENTAL EXAMINATION

A. Introduction

1. The Project was classified as a “B” Project and, therefore, initial environmental examinations (IEEs) for all sample project components (viz., rehabilitation of road, and power distribution line, gas transmission pipeline) were undertaken. The IEE studies were carried out by consultants which was funded through the technical assistance cluster for Capacity Building for Reconstruction and Development.¹ This Summary Initial Environmental Examination is based on these IEE reports.²

B. Project Description

2. The Project involves rehabilitation and reconstruction of road, and power distribution lines gas infrastructure, and petroleum storage. The detailed activities of each project component are summarized in Table A14.1.

Table 14.1: Detailed Activities of Each Project Component

Project Component	Location and Project Scope	Activities
Roads	<ul style="list-style-type: none"> • Rehabilitation and reconstruction of the existing road connecting Pule Khumri – Naibabad – Mazar Sharif Sheberghan – Andkhoy (392 km) 	Patching, crack sealing, surfacing, and asphalt pavement Asphalt overlay
	<ul style="list-style-type: none"> • Rehabilitation of the existing road connecting Naibabad with Hairatan (55 km) 	Repair of 66 existing bridges and 388 drainage structures and culverts, stabilization of embankments, and construction of one bridge and new bus bays
Power Distribution	Rehabilitation of the existing Hairatan – Pule Khumri Power transmission lines in northern provinces and distribution system in and around Kabul	Rehabilitation of the existing substations including installation of new transformers and conductors; rehabilitation of 280 circuit-km of transmission lines and substations; and rehabilitation of the existing distribution line, with total length approximately 230 circuit-km
Gas Infrastructure	Rehabilitation and modernization of gas pipelines from Sheberghan – Mazar Sharif (135 km)	Replacement of the damaged pipeline; cleaning up the corroded pipeline, and arrangements for the waste disposal
	Modernization of gas production facilities	Installation of hydrogen sulfide removal and replacement of other damaged equipment

¹ ADB. 2002. Technical Assistance Cluster to Afghanistan for Capacity Building for Reconstruction and Development, Manila.

² The consultant’s IEE reports for rehabilitation and reconstruction of gas facilities and power transmission and distribution lines require major revisions. The IEE reports for rehabilitation and reconstruction of roads, received on 28 February 2003, is found to be comprehensive, though requiring minor improvements.

C. Description of Environmental Condition of the Project Area

1. Project Area Affected by Road Component

3. The project area connecting Pule Khumri – Naibabad – Hairatan (244 km) lies at an altitude of 400 meters above sea level. The topography is mostly plain, and rolling in a few sections while the section connecting Pule-Khumri to Naubabad passes hilly terrain. Land use along the road is mainly rangeland, agricultural land (e.g., orchards and irrigated agriculture), and residential area. The road crosses two rivers (Pule-Khumri and Jasmesh Spring), which have water only during the spring and early summer seasons, and are dry during the remaining seasons. No lakes or ponds are located in the corridor of this road. There is no ecologically sensitive area along the road corridor.

4. The topography of the corridor area of road connecting Naibabad – Mazar Sharif – Sheberghan - Andkhoy (203 km) is mostly plain. The road passes mainly desert, rangeland, and residential areas. Two rivers (Tanji Tajkargaon and Puleackcha) are crossed by this road. They are filled by water only during the spring and early summer seasons. No lakes or ponds are found in the corridor of this road. No ecologically sensitive area is involved in this project area.

5. The project roads runs through 71 villages. The population densities are very low. In the entire project area, water supply and sanitation facilities do not exist. Energy supply is mostly from firewood, crop residues, and animal wastes.

2. Project Area Affected by Power Distribution and Transmission Component

6. Kabul and its surroundings are the main area of the power distribution component. The area is one of the busiest cities in Afghanistan. The existing environmental problems are dominated by problems related to domestic activities and the traffic sector. The existing distribution line still has very good concentric concrete poles. The facility in the substation is badly damaged. The area is mainly residential area, and no environmentally sensitive area is involved.

3. Project Area Affected by Gas Component

7. The existing gas pipeline covers mainly the area from the border of Uzbekistan, passing through Amu Darya and Sheberghan, and ending in Mazar Sharif. The topography along the pipeline is mainly plain. The project area is mostly irrigated. Land use along the pipeline is mainly agricultural (vineyards, orchards, and gardens). Neither the existing protected area nor the proposed protected area is located in the project area.

D. Potential Impact and Mitigation Measures

1. Road Component

8. There will be no significant environmental impact due to siting of these project roads, because the Project will be executed only on existing roads and none of them are located in an environmentally sensitive area. The environmental impacts associated with the construction stage will include (i) disruption of traffic in the construction area, (ii) increased air pollution due to increasing dust and other volatile chemical substances from the asphalt plant, (iii) noise and vibration, (iv) disruption of the water system due to cut and filling and other earthworks, and (v) potential landslides associated with elevating some parts of the road. These impacts will occur

only during the construction period. However, mitigation measures to minimize them will be adopted including: (i) rerouting traffic with clear signs; (ii) maintaining the optimum moisture content during handling of soil, spraying water to minimize dust, and maintaining a safe distance between the asphalt plant and public facilities, including educational facilities; (iii) strictly control the construction works that create noise and vibration by prohibiting night work in the residential areas; (iv) pumping out of stagnant water, and providing an adequate drainage system; and (v) stabilizing road embankment side slopes, and rehabilitating bridges only in the dry season. All these mitigation measures/requirements will be included in the bidding/contract documents for the contractor. All these impacts are temporary and manageable. The environmental impact associated with the operation of the Project is mainly on traffic safety; therefore, adequate traffic signs and physical barriers to reduce motorists' speed will be adopted. The other important environmental impact that will not concentrate in the road areas is the borrow pit excavation. In this context, strict borrow pit operation will be adopted (i.e., no borrow pits in fertile agriculture lands and area prone to erosion and landslides, restoration and rehabilitation of ex-borrow pit areas).

2. Power Distribution and Transmission Component

9. The screening of potential impacts identifies that there will be no significant environmental impact due to siting of these distribution lines and substation, because the project activities will be executed only at the existing facilities and along the road in Kabul. The potential environmental impacts associated with the construction stage will involve mostly traffic disturbance and accidents due to electric shock. To minimize this impact a clear traffic sign will be placed in the construction area and, if necessary, traffic will be rerouted. Best practices during the installation of cable or distribution lines will be adopted and will be included in the bidding/contract documents to minimize electric shock problems. Therefore, it is clear that the impacts associated with the rehabilitation of distribution lines will be very minimal and the mitigation measures are manageable. No environmental impacts will be associated with the rehabilitation of the substation, particularly related to disposal of damaged equipment (e.g., transformer, conductors). This project component will not involve replacement of transformers and conductors, and will focus on providing new transformers to replace the missing parts. To avoid future environmental problems, it is also recommended that this project component use only (i) Poly Chlorinated Biphenyl– free transformers and conductors; and (ii) chlorofluorocarbon–free cooling equipment. To avoid noise problems, it is recommended to locate the transformers so that noise levels from the fence will not exceed 55 decibels (db) during daytime and 45 dB at night. It is clear that the proposed mitigation measures are practical and manageable, and all will be included in the bidding documents. The transmission line component will focus only on replacing the missing line and fixing the existing line; therefore, no significant impact is expected due to its siting due to construction work or operation. However, the establishment of temporary access roads to reach the transmission towers, and mobilizing the construction material and equipment will cause temporary impacts such as increased dust and traffic disturbance. Mitigation measures, including watering the road and rehabilitating the temporary access road, will be part of the contractor's working requirements (will be included into the bidding/contract document). Similarly, the requirement to provide clear traffic instructions in the project area will also be included in the contractor's bidding/contract documents.

4. Gas Infrastructure Component

10. There will be no significant impact due to siting of this project component, because it will not require any land for expansion and will not affect any protected area. However, there will be some potential environmental impacts involved due to (i) the use of chemicals (e.g., to clean up the corrosive pipeline, use for welding process); (ii) disposal of corrosive equipment, and (iii) disposal of byproducts of the desulfurification process. All of these impacts will affect the downstream area, which is mostly agriculture land. Any chemical contamination into the shallow and deep groundwater will pollute the irrigation water, the residues of these chemical substances will be found in the agricultural products. The following mitigation measures will be employed: (i) a waste management plan will be prepared and submitted to the Asian Development Bank (ADB) for review prior to executing any construction work; and (ii) all hazardous wastes (corrosive pipeline and other corrosive unused equipment) will be stored in clearly labeled containers and will be kept within the area belong to the Executing Agency.

E. Institutional Arrangements and Monitoring Plan

1. Road Component

11. Implementation of mitigation measures during the construction stage will be the responsibility of the contractor. An environmental engineer, who will be hired as part of the consultant team for implementing Project, will assist the Implementation Agency (IA) concerned in preparing contract documentation so that the bidding documents, bills of quantity, and other contractual obligations of the contractor identify the contractor's environmental responsibilities and stipulate penalties for noncompliance. In addition, the consultant will also be required to assist the IA concerned in monitoring the implementation of the environmental management plan that was described in the IEE report.

2. Power Distribution Component

12. Implementation of mitigation measures during the construction stage will be the responsibility of the contractor. The environmental consultant engaged for supervising the construction will be responsible for (i) preparing contract documentation so that the bidding documents, bills of quantity, and other contractual obligations of the contractor identify the contractor's environmental responsibilities and stipulate penalties for noncompliance, and (ii) assisting the IA concerned in monitoring the environmental management plan described in the IEE report.

3. Gas Infrastructure Component

13. The implementation of the mitigation measures during the construction stage will be the responsibility of the contractor. The environmental consultant engaged for supervising the construction will be responsible for (i) preparing a waste management plan to be approved by the IA concerned and submitted to ADB prior to commencement of any construction work; (ii) preparing contract documentation so that the bidding documents, bills of quantity, and other contractual obligations of the contractor identify the contractor's environmental responsibilities and stipulate penalties for noncompliance, and (iii) assisting the IA concerned in implementing the environmental management plan described in the IEE report as well as implementing the waste management plan.

F. Findings and Recommendations

14. The initial findings of the IEE study show that the negative environmental impacts associate with the road and power distribution components are deemed to be minor and the mitigation measures will be incorporated into the contract document for the contractor. The gas component will involve environmental impacts related to hazardous wastes due to unused or damaged equipment that has to be disposed of or chemical wastes due to spillage, leakage, and byproducts. Therefore, an environmental consultant will be hired to assist in preparing a waste management plan. Nonetheless, all the proposed mitigation measures for all project components are manageable, and a full environmental impact assessment to assess further impacts of the Project is not required.

15. The Project will generate environmental benefits, particularly because of the availability of electricity, and improve access to basic services due to the improvement of roads. All the proposed mitigation measures are manageable, and therefore a full Executing Implementation Agency to assess further impacts of the Project is not required.

16. It is, however, recommended that the IA concerned for gas infrastructure needs to be trained to strengthen its capability to deal with hazardous substance and wastes.

G. Conclusion

17. The Project will generate environmental benefits, particularly in improving the environmental performance in gas sector, by reducing deforestation through reduction in the use of firewood because of the availability of electricity, and improve access to basic services due to the improvement of roads. However, the environmental costs due to potential environmental problems associated with the hazardous wastes need to be carefully mitigated. All the proposed mitigation measures are manageable, and therefore a full Executing Implementation Agency to assess further impacts of the Project is not required.