

Technical Assistance Report

Project Number: 47018-001 Policy and Advisory Technical Assistance (PATA) July 2013

Islamic Republic of Afghanistan: Gas Development Master Plan

(Cofinanced by the Afghanistan Infrastructure Trust Fund)

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 10 July 2013)

Currency unit	_	afghani (AF)
AF1.00	=	\$0.01759
\$1.00	=	AF56.85

ABBREVIATIONS

ADB	-	Asian Development Bank
GDMP	_	gas development master plan
kWh	_	kilowatt hour
m³	—	cubic meter
MOMP	_	Ministry of Mines and Petroleum
TA	_	technical assistance

TECHNICAL ASSISTANCE CLASSIFICATION

 Policy and advisory technical assistance (PATA)
 General intervention
 Energy (energy sector development)
 Capacity development (institutional development), economic growth (promoting economic efficiency and enabling business environment), regional cooperation and integration (cross-border infrastructure), private sector development (policy reforms)
 National (high), urban (low), rural (low), regional (low) Afghanistan Infrastructure Trust Fund

NOTE

In this report, "\$" refers to US dollars.

Vice-President	X. Zhao, Operations 1
Director General	K. Gerhaeusser, Central and West Asia Department (CWRD)
Director	R. Stroem, Energy Division, CWRD
Team leader Team member	 A. Aleem, Energy Specialist, CWRD R. Benavidez, Senior Operations Assistant, CWRD P. Koh, Young Professional, CWRD J. Ngai, Counsel, Office of the General Counsel

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A. Indicative Outline of the Final Report

I. INTRODUCTION

1. Development of Afghanistan's enormous natural gas reserves can guarantee energy security, support economic growth, foster development, contribute to fiscal revenue generation, and reduce dependency on donors. With the withdrawal of international troops from Afghanistan in 2014, and subsequent reduction in civilian aid, it is critical that a strategic gas development master plan be developed, institutionalized, and implemented.

2. In February 2013, the Government of Afghanistan requested assistance from the Asian Development Bank (ADB) to develop a 20-year gas development master plan (2015–2035) to assess forecasts for gas demand, the economic uses and consequent supply options (indigenous and imports) for gas, and to formulate a sector investment plan to steer development and exploitation of Afghanistan's vast untapped gas resources. The policy and advisory technical assistance (TA) is included in the country operations business plan for Afghanistan 2013–2014.¹

3. The consultation mission was fielded in February 2013 and the fact-finding mission in June 2013, and the government and ADB agreed on the scope, implementation arrangements, cost, financing arrangements, and the consultants' terms of reference for the TA.² The design and monitoring framework is in Appendix 1.

II. ISSUES

4. Persistent conflict and security challenges have inhibited development of gas infrastructure to reinforce energy security in Afghanistan. The Afghan gas sector has technical, financial, and governance weaknesses and lacks integrated planning. According to recent studies conducted by the United States Geological Survey and the Afghan Ministry of Mines and Petroleum (MOMP), the total estimated undiscovered technically recoverable natural gas reserves in Afghanistan stand at 444 billion cubic meters (m³), in addition to already identified reserves of 75 billion m³. Moreover, Afghanistan is also exploring gas importation options with neighboring Turkmenistan and Iran.

5. Despite the potential, the lack of sector planning since the 1970s has constrained development of the natural gas supply chain (production, transmission, and distribution allocation), which has affected economic growth. Without a gas development master plan and an investment framework, effective identification, harmonization, and sequencing of expansion programs are a critical challenge, and constrain the investment projects to be funded by the government and its development partners. Private sector investment and technology transfer in this lucrative sector are also impeded and diminished. The proposed ADB support for production of the country's first gas development master plan will assist the government in assessing gas resource potential (indigenous and imports), and in identifying clear priorities, development strategies, and sources to improve the system supply chain and efficiency. This framework will help the government develop an action plan that provides cost-effective alternatives with accompanying investment requirements.

6. Afghanistan's National Development Strategy³ confirms economic development as the top priority and the availability of sufficient energy resources as one of the keys to achieving this

¹ ADB. 2012. Country Operations Business Plan: Afghanistan, 2013–2014. Manila.

² The TA first appeared in the business opportunities section of ADB's website on 4 April 2013.

³ Government of Afghanistan, 2008. Afghanistan National Development Strategy 2008–2013: A Strategy for Security, Governance, Economic Growth and Poverty. Kabul.

objective. Afghanistan's per capita energy consumption (2009), in kilograms of oil equivalent, stands at 71, compared to 575 in India, 489 in Pakistan, and 1,807 in People's Republic of China. Currently around 20% of country's population is connected to power grid and less than 1% households are connected to gas infrastructure. For Afghanistan, a sound energy policy mandates supply diversification in order to achieve energy security. Afghanistan is highly reliant on imported energy in the form of electricity and oil, resulting in significant exposure to energy price volatility; because potential domestic gas fields have not yet been fully explored and developed, the dependency of the energy sector on imported power and fuels is likely to increase.⁴ The current cost of electricity generation in Afghanistan from diesel and furnace oil ranges between \$0.4 to \$0.6 per kilowatt hour (kWh) while the electricity produced from gas would range between \$0.07 to \$0.15 per KWh. Against this backdrop, the master plan study would explore the trade-offs between increasing energy security through fuel diversity, minimizing costs to the Afghan economy and lowering environmental impacts.

7. The government recognizes that there is a need to draw lessons from best international experience in development of the gas sector and to implement a medium and long-term gas development master plan (2015–2035) in Afghanistan addressing sustainable development of the country's natural gas resources, national energy supply security, and environmental protection. It is estimated that nearly \$5 billion in grant assistance and private sector investment will be provided to the Afghanistan energy sector during 2013–2016, part of which will finance critical gas sector development projects. The government and its development partners have identified the oil, gas, and minerals sectors as top revenue sources to support economic growth following the 2014 withdrawal of foreign troops and associated reduction in grant assistance. Therefore, there is an urgent need to undertake the necessary groundwork and introduce a long-term strategic master plan to guide investment in the gas sector.

8. The master plan will (i) review current policies and plans related to gas development, as well as best international experience; (ii) assess gas resource potential (indigenous and possible import options); (iii) evaluate the optimized economic use of gas through a set of gas allocation policy options; (iv) present gas supply and demand planning scenarios, assumptions, and sensitivity factors with respect to economic sectors and industries; and (v) preliminarily prioritize programs, determine linkages with the power sector, and rank critical investment projects to build and strengthen economic infrastructure during 2015–2035.

9. A massive increase in the country's gas sector productivity must be preceded by regulatory and institutional reforms, which are part of the process of nation building in Afghanistan. Regulatory reforms include tariff setting. Tariffs are the basis on which revenues from gas sales to domestic markets will be calculated, and should be established in a transparent manner. In terms of institutional reforms, MOMP has oversight over the supply chain investments, and will review the coherence of the gas investment plans with other energy plans, and verify their economic justification. The gas development master plan will factor these parameters into its analyses.

10. Effective coordination between the power and gas subsectors is crucial, as the power sector is envisaged to be the largest consumer of gas. Both sectors are capital intensive, meaning efficient, least-cost investment solutions for both sectors cannot occur without close harmonization. Appropriate policies pertaining to sector planning, regulatory and operational protocols, and the transmission and distribution network investments require knowledge of the long-term plans of the power sector with respect to capacity addition, and the location of added

⁴ In 2012, nearly 70% of electricity and 90% of oil was imported.

capacity. Likewise, planning for future gas-fired power generation plants must take into account the constraints of and future investment plans for the gas sector. The recently completed power sector master plan will serve as a base document for power sector investment in Afghanistan (2012–2032).⁵

11. The TA will ensure that capacity support to sustain sector master planning is factored into the program. A group of five counterpart employees from MOMP will also work with the team of international consultants through participation in technical working groups and preparation of issue papers and technical studies. The international consultants will provide hands-on training for these seconded employees, which will ensure the continuity and sustainability of the planning office once the TA project closes. These professionals will be reabsorbed into the executing agency from January 2015.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

12. The TA will support and strengthen gas sector restructuring, and planning, prioritizing, and sequencing of projects in the country's emerging gas sector. It will ensure development of a coherent gas sector strategy through inter-ministerial coordination and collaboration with all stakeholders, including development partners and the private sector, to streamline vertical and horizontal linkages, and will provide capacity and analytical support to sustain strategic and integrated sector modeling in Afghanistan.

13. The impact will be improved energy security in Afghanistan through increased gas production from 360,000 cubic meters (m³) per day in 2012 to 5.0 million m³/day in 2025, and an increase in the grid-connected electrification ratio, from 20% in 2012 to 40% in 2025. The outcome will be improved capacity of MOMP for investment planning and programming in the gas sector supply chain, with the (i) gas resource potential estimated and investment programming prioritized in accordance with priorities identified and sequenced in a gas development master plan, by December 2014; (ii) approval by the Cabinet and the Parliament of the gas development master plan by December 2014; and (iii) institutionalization of the gas development master plan and establishment of a related department in MOMP by December 2014.

B. Methodology and Key Activities

14. The TA will (i) assess Afghanistan's gas resource potential (indigenous and possible importation options) and its optimized economic use, as well as environmental impact; (ii) determine major allocation sectors and load centers, including a gas demand forecast for a 20-year period (2015–2035); (iii) formulate a strategy for upstream, midstream and downstream gas sector development; (iv) identify investment projects to sustain the Afghan gas sector and its linkages with power sector investments; and (v) prepare a capacity development plan for MOMP to sustain gas development master planning in Afghanistan. For this purpose, by December 2014 the TA will (i) establish a gas production, transmission and distribution database; (ii) build consensus among stakeholders on gas sector data analyses and investment designs; (iii) develop a list of priority gas allocations sectors and investment programs (2015–

⁵ ADB. 2010. *Technical Assistance to Afghanistan for the Power Sector Master Plan.* Manila (TA 7637-AFG, \$1,500,000, approved on 6 November 2011).

2035); and (iv) train five MOMP members to update and sustain the gas development master plan.

15. With respect to assumptions and risks, it is assumed that the government and donors remain committed to energy sector reforms and investments, that strong political will and prompt decision making underpin sector self-sustainability, and that development partners maintain a strong interest in the sector. There is a risk that political stability and security may deteriorate after the 2014 withdrawal of foreign troops, which may dissuade contractors and consultants from bidding for and implementing power projects in Afghanistan.

C. Cost and Financing

16. The TA is estimated to cost \$1,600,000 equivalent, of which \$700,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-V), and \$800,000 will be financed on a grant basis by the Afghanistan Infrastructure Trust Fund⁶ and administered by ADB. The government will provide counterpart support in the form of security, office space, transportation, counterpart staff, and other in-kind contributions, and will also facilitate meetings and provide access to requisite data. The cost estimates and financing plan are in Appendix 2.

D. Implementation Arrangements

17. MOMP will serve as the executing agency. MOMP (i) is in charge of planning and implementation of gas and petroleum sector projects in Afghanistan; (ii) serves, through the Afghanistan National Development Strategy, as the focal ministry for infrastructure development in Afghanistan; and (iii) is responsible for negotiating and finalizing all contracts and agreements (international and national) related to mining, gas, and petroleum projects in Afghanistan.

The TA will be implemented over 13 months from 1 October 2013 through 31 October 18. 2014. It will require four international experts who will provide a total of 30 person-months of consulting services, and two national experts who will provide a total of 24 person-months of consulting services. Required positions include an upstream and midstream gas sector development expert, gas sector expert (downstream), energy or gas economist, environment specialist, national gas specialist, and a national data collection expert and logistics manager. The team will drive the discussions, engagement and formulation of the gas development master plan, engage with all stakeholders, lead technical group meetings and workshops, and formulate requisite documentation as and when required. It is expected that MOMP-seconded staff will be retained by the master planning cell to ensure continuity and sustainability until TA completion in 2014. The terms of reference for consultants are in Appendix 3. ADB will engage a consulting firm using the quality-based selection method following the Guidelines on the Use of Consultants (2010, as amended from time to time). All disbursements under the TA will be in accordance with ADB's Technical Assistance Disbursement Handbook (2010, as amended from time to time). The progress on the output of the TA will be disseminated through periodic reports, workshops and the MOMP websites, and the Afghanistan Energy Information Center.

IV. THE PRESIDENT'S DECISION

19. The President, acting under the authority delegated by the Board, has approved (i) ADB administering a portion of technical assistance not exceeding the equivalent of \$800,000 to be financed on a grant basis by the Afghanistan Infrastructure Trust Fund, and (ii) ADB providing the balance not exceeding the equivalent of \$700,000 on a grant basis, to the Government of Afghanistan for the Gas Development Master Plan, and hereby reports this action to the Board.

⁶ Contributors: the governments of Japan, the United Kingdom, and the United States of America.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with	Data Sources and Reporting	Assumptions and Risks
e anna y	Baselines	Mechanisms	
Impact Improved energy security in Afghanistan	Gas production increased from 360,000 m ³ /day in 2012 to 5 million m ³ /day in 2025 Grid-connected electrification ratio increased from less than 20% in 2012 to 40% in 2025	Afghanistan Central Statistical Organization and Ministry of Mines and Petroleum publications Inter-Ministerial Commission for Energy quarterly reports Da Afghanistan Beshna Sherkat annual reports	Assumption Government and donors remain committed to energy sector reforms and investments Risks Political stability and security deteriorate Contractors and consultants lack interest to implement power projects in Afghanistan
Outcome Improved Ministry of Mines and Petroleum capacity in the areas of investment planning and programming in gas sector supply chain	Gas resource potential estimated and investment programming prioritized in accordance with projects identified and sequenced in gas development master plan by December 2014 Gas development master plan approved by the Cabinet and the Parliament by December 2014 Gas development master plan institutionalized and department established in the Ministry of Mines and Petroleum by December 2014	Inter-Ministerial Commission for Energy quarterly reports Ministry of Mines and Petroleum publications and website Gas sector master plan reports Inter-Ministerial Commission for Energy quarterly reports Ministry of Mines and Petroleum publications and website Ministry of Mines and Petroleum publications and website	Assumptions Strong political will to make Afghanistan self-sustaining in the gas sector Prompt decision making by Ministry of Mines and Petroleum and other stakeholders Risk Other capacity-development programs and initiatives in the sector are discontinued due to insufficient support from international development partners
Outputs A gas development master plan with the following features: 1. Assessment of gas resource potential (indigenous and possible importation optimized economic use and environmental impact 2. Determination of major allocation sectors and load centers, including gas demand forecast for	By December 2014: Established gas production, transmission and distribution database Agreed gas sector data analyses and investment designs Developed list of priority gas allocations sectors, investment programs (2015–2035) Five staff members of Ministry of Mines and	Ministry of Mines and Petroleum publications and website Inter-Ministerial Commission for Energy quarterly reports	Assumptions Government's ownership and sustainability of sector reforms continue Interest of development partners in sector remains high

	Design Summary	Performance Targets and Indicators with	Data Sources and Reporting	Assumption	s and Risks
3. 4. 5.	a 20-year period (2015–2035) Formulation of strategy for upstream, midstream, and downstream gas sector development Identification of investment projects to sustain Afghan gas sector and its linkages with power sector investments Preparation of capacity development plan for Ministry of Mines and Petroleum to sustain gas development master planning in	Petroleum trained to update and sustain the Gas Development Master Plan			
Ac 1. 2.	Afghanistan Activities with Milestones 1. Selection and recruitment of consultants and the deputation of seconded counterpart staff from Ministry of Mines and Petroleum (30 September 2013). 2. Consultants begin field work, gather and analyze data, consult with stakeholders and submit inception report by 30 November 2013 and interim report by 31 March		Inputs ADB - \$700,000 Item Amount (\$) Consulting 300,000 Travel 120,000		
 2014. Presentation of inception reports to relevant stakeholders by 31 December 2013 and interim report by 30 April 2014. Convening regular monthly meetings and quarterly workshops and technical working groups meetings during 1 September 2013 through to 31 August 2014. Ministry of Mines and Petroleum staff to undergo training on updating of gas 			Reports Equipment Training Surveys Misc. Contingency	70,000 40,000 50,000 10,000 10,000 100,000	
6.	development master plan Consultants present the workshops and dissemin	n during 1–30 September 201 draft final report on 30 Septer nation sessions to finalize the	4. nber 2014, and hold report by 31 October 2014.	Trust Fund - \$	Amount (\$) 800,000
				Note: The Gov provide counter in the form of s space, transpo counterpart sta in-kind contribut facilitate meetin provide access data.	ernment will rpart support security, office rtation, aff, and other utions, ngs and s to requisite

 m^3 = cubic meter

COST ESTIMATES AND FINANCING PLAN

(\$'000)

Item	Amount
A. Asian Development Bank ^a	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	150.0
ii. National consultants	150.0
 International and local travel 	120.0
c. Reports and communications	70.0
2. Equipment ^b	40.0
Training, seminars, and conferences	
a. Facilitators	20.0
b. Training program	30.0
4. Surveys	10.0
Miscellaneous administration and support costs	10.0
6. Contingencies	100.0
Subtotal (A)	700.0
 B. Afghanistan Infrastructure Trust Fund^c 1. Consultants 	
a. Remuneration and per diem	000.0
I. International consultants	800.0
Subtotal (B)	800.0
Total	1,500.0
Note: The technical assistance (TA) is estimated to cost \$1,600,000, of which contribution	utions from the Asian

Development Bank and the Afghanistan Infrastructure Trust Fund are presented in the table above. The government will provide counterpart support in the form of security, office space, transportation, support staff, and other in-kind contributions. The value of government contribution is estimated to account for 6% of the total TA cost. ^a Financed by the Asian Development Bank's Technical Assistance Special Fund (TASF-V).

^b Includes four laptop computers and two printers for use by consultants. All equipment will be handed over to the Ministry of Mines and Petroleum upon completion of the TA.

^c Contributors: The governments of Japan, the United Kingdom, and the United States of America. Administered by the Asian Development Bank.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Objective

The objective of the policy and advisory technical assistance (TA) is to prepare a 1. medium- and long-term gas development master plan (GDMP) 2015-2035 for Afghanistan that will contribute to the sustainable development of the country's natural gas resources, national energy supply security, and protection of the environment. The TA will assist in the (i) preparation of gas demand and supply outlook and scenarios; (ii) development of market assessments and netback analysis; (iii) review of current policies and plans in the context of gas development; (iv) assessment of the financial requirements and needs; (v) evaluation of pricing options for various segments with respect to domestic sales and transit and/or exports; (vi) development of a planning model and training of staff from the Ministry of Mines and Petroleum (MOMP) on its use; (vii) assessment of environmental, socioeconomic, and non-monetary impacts; (viii) review of other countries' experiences with gas supply chain development, including compressed natural gas; and (ix) formulation of the Afghanistan GDMP and implementation strategy, with sequencing of priority investment projects. The consultant will be required to provide hands-on training to seconded employees, which will ensure continuity and sustainability of the planning office once the TA project closes.

B. Scope of Work¹

1. International Consultants²

2. **Gas sector development specialist** (upstream and midstream, 9 person-months). The gas sector development specialist will be an energy economist, engineer or manager with a degree in economics, engineering or management and should possess a minimum of 10 years of relevant international experience and specialization in upstream and midstream gas development. The person should be technically able to assess and understand reservoir and basin reports and gas-supply scenarios (indigenous resource potential and import options), including reviewing current market conditions and bottlenecks, and identifying investment programs that are technically and financially feasible, and ranking them economically. At least 5 years of relevant experience in developing countries would be preferred. He or she will undertake the following:

- (i) review current and past diagnostic work in Afghanistan's gas sector;
- (ii) analyze the existing institutional framework of the Afghan gas sector, its linkages with the power sector and the overall energy mix, and import options, and evaluate existing and proposed transmission expansion and distribution plans;
- (iii) undertake a benchmarking study that compares current market conditions and system bottlenecks (upstream and midstream) in Afghanistan with lessons from comparable countries in the region and suggest a path to develop a domestic

¹ The consulting firm can propose changes in the number of person-months of inputs for each consultant in order to most effectively deliver the outputs, providing there is no cost impact.

² The team leader can be the (i) senior gas development sector specialist, (ii) gas sector expert, or (iii) energy economist. They should be able to provide leadership and oversee management of the GDMP, coordinate with other team members to develop and revise work plan and implementation schedule, and seamlessly engage with all internal and external stakeholders to manage the quality of the final product. The team leader would coordinate and consolidate the outputs of all individual consultants, oversee preparation and submission of reports, facilitate and promote professional capacity building among sector managers in MOMP, and prepare an agreed and realistic transition plan for the sustainability of the GDMP and train local staff seconded by the executing agency to ensure continuity and sustainability once the PATA closes in end 2014.

gas market that will follow the trajectory of the target countries and achieve similar objectives;

- (iv) analyze medium-term gas supply and demand balances while assessing the present and future average and peak demand requirements that take into account growth in industrial production, power generation, transport, and commercial and household sectors—i.e., market conditions in 2035;
- (v) analyze the technical and financial feasibility and the economic benefits of alternative gas development and utilization scenarios;
- (vi) identify project packages that are technically and financially feasible and rank them economically, taking domestic policy priorities into account (i.e., using a "structured economic ranking"), prioritize development projects under the overall GDMP and recommend a least-cost investment plan based on fossil fuel forecasts over the medium to long term (20–50 years) to eliminate the potential for gas shortages in the production and delivery system, and carry out an evaluation of manpower requirements for implementation and operation of projects identified under the GDMP;
- (vii) explore the opportunities for public–private partnerships and other innovative financing mechanisms for development of the gas sector in Afghanistan, and develop forecast of employment creation and required capacity building, training, and sustainability;
- (viii) recommend a regulatory structure for growth and future investments in the Afghan gas sector and assess the current situation and recommend a road map for institutional and capacity development issues, including required changes to the gas sector structure and the legal and regulatory framework to ensure accountability, predictability, transparency and efficiency in sector operations; and
- (ix) advise MOMP on matters related to the gas supply chain and lead meetings and workshops related to GDMP; liaise with key stakeholders and (in partnership with them) develop key information linkages, institutional support, and data gathering.

3. **Gas sector expert** (downstream, 9 person-months). The gas sector expert will be a senior energy economist or engineer, or manager with a degree in economics, engineering or management and should possess a minimum of 10 years of relevant experience, with a specialization in the downstream subsector, including compressed natural gas. He or she should have a minimum of 5 years of experience in developing countries. The person will:

- (i) review proposed and ongoing downstream developments (investment and policy reforms) in the gas sector, and undertake comprehensive analyses of Afghanistan's gas sector resources (indigenous and potential imports), along with its development potential, including the development of all gas resources;
- (ii) (a) identify key institutional, legal and regulatory, pricing, utilization, and market-related gaps that need to be addressed, and major load centers, including a gas demand forecast for 2015–2035; (b) develop allocation priorities and a strategy for downstream economic sectors; (c) produce a series of investment projects that will support the Afghan gas sector and its linkages with power sector investments; and (d) formulate a capacity development plan to sustain gas sector master planning in Afghanistan;
- (iii) recommend an economic pricing model and model gas purchase and sales agreement;
- (iv) identify impediments to the fast-track development of the domestic gas market and recommend solutions to alleviate and/or remove such impediments;

- (v) evaluate and enumerate key policy and regulatory issues relating to the development of the gas sector, and identify challenges and possible solutions; and
- (vi) liaise with other development partners active in the Afghan gas sector including the United States government agencies (United States Agency for International Development and the United States Department of Defense), the World Bank and private investors and contractors.

4. **Energy and/or gas economist** (9 person-months). The energy and/or gas economist will be an experienced professional with a degree in economics or finance or a related discipline and will have a minimum to 10 years of experience. The economist will be expected to deliver a dynamic GDMP model to stimulate gas production and import, transmission, and distribution infrastructure for the purpose of preparing an investment program and ascertaining the feasibility of different development schemes. The financial and economic models outputs should include:

- the need for allocation of gas and supply chain infrastructure, with size and capacity requirements indicated by the optimal location and timing of their commissioning;
- (ii) an economic-demand scenario based on market-based pricing (including recommendations for price adjustment while responding to market realities) for implementation over a reasonable time period, and determination of the optimum gas allocation and share of gas in the primary sources of energy;
- (iii) identification of short-, medium-, and long-term projects in exploration, production, transmission, and distribution, to enable an integrated investment program;
- (iv) identification of project packages that are technically and financially feasible (these should be ranked economically, taking into account domestic policy priorities); prioritization of development projects under the gas development framework; and recommendation of a least-cost investment plan;
- (v) identification of investment requirements (including fiscal and financial aspects) of proposed exploration, production, and transmission projects, along with a suggested timeline of commissioning;
- (vi) a proposed financing plan for economically feasible capital investment projects, including an investment timeline for 2015–2035, with a critical path of projects that need to be financed;
- (vii) an economic and financial analysis of future projects, including identification of the least-cost and optimal gas-based solutions for Afghanistan;
- (viii) a cost-benefit analysis of the key economic sectors and future investment projects within these sectors, including a comparative analysis with substituted fuels; and
- (ix) an assessment of economic and sustainability issues, and sensitivity and risk analyses.

5. **Environmental safeguard specialist** (3 person-months). The environmental safeguard specialist will have a bachelor's or higher degree in environmental engineering and/or science and at least 10 years of relevant experience in carrying out environmental studies, including environmental impact assessments of gas infrastructure projects. Previous experience in undertaking environmental studies and analyses in the power sector in developing countries is desirable. The specialist will undertake the following:

(i) review existing data, assess gaps, compile a list of the environmental and social impacts and issues relevant to the gas sector and potentially affected parts of Afghanistan, and make recommendations regarding future actions;

- (ii) undertake environmental or climate change assessments and quantify the impact from other fuels in various sectors and programs identified under the master plan;
- (iii) replicate regional environmental management experience for the gas sector project;
- (iv) evaluate the impact of the proposed programs and investments and suggest mitigation measures and action plans;
- (v) recommend a strategy to address health, safety, and environmental issues in Afghanistan's gas sector, including either deliberate and environmentally sound abandonment or refurbishment (where applicable) of current plant property and equipment at Gerquduq, Khoja Gogordak, in Sheberghan; and
- (vi) identify environmental and poverty-combating priorities and how these may be influenced by gas development options and alternatives, and assess the country's related institutional and economic capacity to address the negative consequences of gas development.

2. National Consultants

6. **Deputy team leader and gas specialist** (12 person-months). The expert must possess a minimum of bachelor's degree in finance or engineering with at least 5 years of experience working in the Afghan energy sector. The expert should possess strong communication skills in English and Dari and be able to interact and engage in sector discussions with stakeholders. The deputy team leader and gas specialist will work closely with the team leader on the following outputs:

- (i) assist the team leader in conducting a comprehensive overview of the Afghan gas sector, along with its development potential, including the development of all gas resources;
- (ii) analyze international agreements (existing and under negotiation) related to gas sector imports and exports;
- (iii) identify the impediments to the fast-track development of the Afghan gas market;
- (iv) facilitate organization of workshops, dialogue, and brainstorming sessions regarding key infrastructure and policy gaps that need to be addressed to improve the gas development framework in Afghanistan;
- (v) analyze the investment climate for the development of the domestic gas market;
- (vi) design and facilitate capacity building in the key policy areas that need to be addressed and facilitate on-the-job training for selected counterparts of the executing agency; and
- (vii) assist the team in the timely and effective delivery of assignment outputs and closely coordinate with government counterparts and other stakeholders.

7. **Data collection expert and logistics manager** (12 person-months). The expert must possess a minimum of bachelor's degree in social sciences with at least 3 years of experience in working in a public sector or with a development partner. The expert should possess good communication skills in English and Dari and be able to work closely with government ministries, agencies, and development partners in acquiring data and running day-to-day logistical operations of the office, (e.g., scheduling meetings, and preparing reports). The expert's duties include:

- (i) assist the consulting team in coordination and day-to-day management of assignment operations, including interaction with stakeholders;
- (ii) undertake gap analyses and follow up with all stakeholders on gathering and documentation of data;
- (iii) ensure that meetings are scheduled and all stakeholders are invited;

- (iv) take meeting minutes and ensure their adequate and timely dissemination;
- prepare a database of all queries and correspondence with all stakeholders, and (v) ensure queries and issues are adequately addressed and thoroughly documented; and
- (vi) undertake other related tasks to meet assignment objectives.

C. **Reports and Workshops**

8. GDMP progress reports will be based on continued information exchange, dialogue with stakeholders, and assessment of existing data. The following reports will be submitted by the consultants in English (some reports will also be translated into Dari and Pashtu) to the government and the Asian Development Bank (ADB). Both the government and ADB will be required to provide feedback and input, in writing, on these reports within 30 days of its submission.

Identification and	Within 1 month of project commencement, the consultants will design and hold a
Consensus-Building	consensus-building workshop to bring together key stakeholders, including government
Workshop	agencies, international development partners, private sector participants, civil society
	organizations, and media representatives for a brainstorming session (with facilitation)
	on key sector issues, and infrastructure and policy gaps that need to be addressed to
	produce an inclusive gas development master plan for Afghanistan.
Inception Report	Within 2 months of project commencement, the consultants will prepare an inception
	report that will include the revised workplan and implementation schedule, changes or
	revisions in scope, if any, and an agreed workplan through December 2014, with priority
	actions and milestones.
Quarterly Reports	Quarterly reports will be submitted and disseminated during the first 30 days of the
	following quarter and should analyze the status of the gas development master plan
	study, any sector issues, and the investment profile and implementation issues,
	highlighting key issues and recommending future actions.
Interim Technical	By 31 December 2013, the consultants will submit an interim evaluation stating mid-year
Assistance Evaluation	progress against milestones agreed on in the inception report, and suggesting changes
Report and	in implementation and terms of reference (if required), resource requirements and the
Presentation	work program for the remaining period; the report will be followed by a presentation to
	key stakeholders to solicit feedback for future work.
Draft Technical	To be submitted 2 months prior to completion of the TA. The report will list all activities
Assistance Evaluation	undertaken by the consultants, with recommendations, including (i) assessment of gas
Report	resource potential (indigenous and possible import options) and its optimized economic
	use; (ii) determination of major load centers including gas demand forecast for 2015–
	2035; (III) a strategy for upstream, mostream, and downstream gas sector development,
	(iv) a series of investment projects identified to sustain Aighan gas sector and its
	inkages with power sector investments, and (v) a capacity development plan to sustain
	avechange of information and other resources stakeholder participant information
	training provided and final outcomes of implementing the TA
Workshops	A consultative workshop in Kabul for key stakeholders will be scheduled 2 weeks after
Werkenope	submission of the draft final report to present findings of the gas development master
	plan study All feedback and input received should be carefully analyzed and
	incorporated in the final report.
Final Technical	To be submitted electronically, in hard copy, and disseminated through a final ministerial-
Assistance Evaluation	level presentation (to the government's infrastructure cluster) within 1 month of receipt of
Report	comments from the government, ADB, and other stakeholders.
ADB = Asian Development	Bank, TA = technical assistance.

Reports and Workshops

Sources: ADB and Government of Afghanistan.