ASIAN DEVELOPMENT BANK **TAR:INO 32390**

TECHNICAL ASSISTANCE
(Financed from the Japan Special Fund)

TO THE

REPUBLIC OF INDONESIA

FOR

PREPARING A GAS SECTOR DEVELOPMENT PLAN

June 2001

CURRENCY EQUIVALENTS

(as of 23 May 2001)

Currency Unit	–	Rupiah (Rp)
Rp1.00	=	$0.000088
$1.00	=	Rp11,420

The exchange rate of the rupiah is determined by Bank Indonesia under a system of managed float. For the purposes of this report, an exchange rate of Rp 10,000 has been used.

ABBREVIATIONS

ADB	–	Asian Development Bank
CBM	–	coalbed methane
GSDP	–	gas sector development plan
LNG	–	liquefied natural gas
MEMR	–	Ministry of Energy and Mineral Resources
MIGAS	–	Directorate General of Oil and Natural Gas
PERTAMINA	–	Perusahaan Tambang Minyak Negara (national oil and gas company)
PGN	–	PT Perusahan Gas Negara (state gas corporation)
PSC	–	production sharing contract
TA	–	technical assistance
USTDA	–	United States Trade and Development Agency

WEIGHTS AND MEASURES

MMCFD	–	million cubic feet per day
TCF	–	trillion cubic feet

NOTES

(i) The fiscal year of the Government ends on 31 December.
(ii) In this report, “$” refers to US dollars.

I. INTRODUCTION

1. The Asian Development Bank (ADB)'s operational program for Indonesia for 2001 includes technical assistance (TA) to prepare a gas sector development plan (GSDP).[1] The TA Fact-Finding Mission visited Indonesia from 3-7 July 2000 to discuss with the Government the objectives, scope, and terms of reference for the advisory TA. The Government's official request for the TA endorsing the findings of the Fact-finding Mission was received in December 2000. The TA framework is presented in Appendix 1.

II. BACKGROUND AND RATIONALE

2. The hydrocarbon sector has historically been the main source of export earnings for Indonesia. Prior to the economic and financial crisis that began in 1998 the hydrocarbon sector accounted for about 24 percent of total exports with gradually declining proven oil reserves. During the crisis, the importance of the hydrocarbon sector as a source for foreign exchange earnings increased and in 2000 accounted for about one third of Indonesia's exports. However, at present, the Government is spending about $8 billion equivalent a year in direct and indirect subsidies on locally produced and imported petroleum products to keep the domestic prices of petroleum products at acceptable levels for the general public. Over the next three years the Government is planning to gradually eliminate its subsidies on petroleum products; maximize the export of energy by developing tradable energy resources such as oil, coal, and liquefied natural gas (LNG); and diversify domestic energy consumption by using nonexportable fuels such as natural gas, which is not exportable as LNG because of the size of the gas field,[2] to reduce the heavy reliance on tradable petroleum products. This is expected to substantially increase the amount of the Government's budget available for other social expenditures.

3. The Ministry of Energy and Mineral Resources (MEMR) is responsible for regulating and monitoring the hydrocarbon sector in Indonesia. It is also responsible for the overall development and implementation of Government policies in the energy sector. MEMR encompasses the Office of the Inspector General and three directorates general, of which the Directorate General of Oil and Natural Gas (MIGAS) is responsible for the oil and gas industry. The other two directorates are responsible for the power subsector and the geology and mineral resources subsector, respectively. MIGAS supervises (i) Perusahaan Tambang Minyak Negara (PERTAMINA), the national oil and gas company, for exploration, production, processing, and marketing of Indonesia's oil and natural gas; and (ii) PT Perusahaan Gas Negara (PGN), the state gas corporation, for gas transmission and distribution. The main activities of PERTAMINA in the natural gas subsector include (i) exploration and development of gas fields through direct participation and the establishment of production-sharing contracts (PSCs) with international oil and gas companies; (ii) negotiation of gas prices under PSCs; (iii) operation of gas transmission and distribution systems for supplies to bulk consumers; (iv) provision of equity in major downstream gas utilization projects; and (v) negotiation of LNG supply contracts with potential buyers. At present, PGN's main activities are (i) distribution of natural gas purchased from PERTAMINA in five major cities in Indonesia (Bogor, Cirebon, Jakarta, and Surabaya in Java, and Medan in North Sumatra); (ii) operation of the trans-Sumatra gas transmission pipeline; and (iii) construction of the South Sumatra to Singapore gas transmission pipeline.

[1] The TA first appeared in *ADB Business Opportunities* in August 2000.
[2] Because LNG projects are highly capital intensive, gas fields need to contain sufficiently large recoverable natural gas reserves to make conversion to LNG, shipment, and regasification by the buyer economically viable.

4. Indonesia is well endowed with both exportable and nonexportable natural gas reserves. It has proven natural gas reserves of a minimum of 73 trillion cubic feet (TCF) and proven and probable natural gas reserves of a minimum of 160 TCF. About 75 percent of the natural gas reserves are in Sumatra, and offshore at Natuna, which is located in Natuna Sea between Peninsula Malaysia and Kalimantan. Present annual natural gas production is estimated at 3.1 TCF. Exports of natural gas as LNG have always exceeded domestic consumption of natural gas; over the past few years about 60 percent of natural gas consumption was exported as LNG. At present, natural gas meets about 20 percent of Indonesia's domestic energy needs and amounts to about 0.7 TCF per annum. About one half of the natural gas is used in the industry sector, primarily as feedstock for fertilizer, industrial, and other petrochemical plants; about 40 percent is used for the power sector; and the remaining 10 percent for small- and medium-scale industries, commercial establishments, and households. However, given the scale of its gas reserves, Indonesia's present domestic natural gas consumption accounts for about 18 percent of total primary commercial energy supply only and is among the lowest of the countries in southeast Asia. Likewise, the domestic gas sector and associated infrastructure are underdeveloped and the environmental benefits as a result of using increased quantities of natural gas are not realized. ADB is supporting gas infrastructure development in South Sumatra under the Gas Transmission and Distribution Project,[3] which has resulted in the successful completion of the first major gas transmission pipeline of about 510 kilometers in Sumatra. Construction of additional gas transmission pipelines is planned under the project to supply natural gas from South Sumatra to Singapore.

5. Prior to 1998, domestic natural gas consumption increased by 8 to 9 percent per annum. With the onset of the economic and financial crisis, domestic natural gas consumption leveled off and stabilized at about 1,900 million cubic feet per day (MMCFD) for the whole of Indonesia, including about 850 MMCFD for Java. However, assuming that over the next two to three years, Indonesia will be able to recover to achieve economic growth rates of at least 5 percent per annum and gradually eliminate Government subsidies on petroleum products (and indirectly on electricity tariffs for consumers) natural gas demand in Java is expected to increase by 1,000-1,200 MMCFD with the additional natural gas mainly used for power generation and in manufacturing industries. As identified in ADB's Study for Development of Gas Infrastructure in Java[4] at least $2 billion in investments will be required over the next three years to transport natural gas to consumers in Java (excluding investments required for natural gas production and processing) assuming that the subsidies on petroleum products will be gradually eliminated during the same period.

6. In 1995, the Government embarked on a reform process for the gas sector with the aim to increase development of Indonesia's natural gas resources and mobilize the required financing from the private sector for natural gas production, processing, and transmission. In 1995, ADB provided TA[5] to support the development of a corresponding gas sector policy and a regulatory framework, which resulted in a broad agreement on the requirements of such a policy and regulatory framework among the various public and private parties involved in the gas sector. However, subsequently, a separate policy and regulatory framework for the gas sector were not adopted as the Government chose to expand its reform process to include the petroleum sector as well. It also decided that to reform the oil and gas sectors a new oil and gas law would need to be prepared that among others would enable a reorganization of

[3] Loan 1357-INO: *Gas Transmission and Distribution*, for $218 million, approved on 18 June 1995.
[4] TA 2783-INO: *Study for Development of Gas Infrastructure in Java*, for $575,000, approved on 17 April 1997 and completed in January 2001.
[5] TA 2344-INO: *A Study to Establish Gas Regulatory Framework*, for $450,000, approved on 8 June 1995.

PERTAMINA along commercial lines and a transfer of PERTAMINA's supervisory and regulatory functions to MEMR. ADB is assisting the Government with preparing the gas sector sections of the new oil and gas law and the regulations for implementation of the natural gas provisions of the law and for support of the initial operations of a regulatory authority for the gas sector.[6] The United States Agency for International Development is providing assistance to MIGAS for the development of a petroleum policy and drafting of the petroleum sections of the new oil and gas law and corresponding regulations. MEMR has submitted the new oil and gas law to Parliament, which is expected to approve the law this year.[7]

7. The Government also realizes that the exploration activities and actual development of discovered natural gas resources are largely determined by the terms and conditions of Indonesia's PSCs that govern the exploration and production of Indonesia's oil and gas reserves. However, despite Indonesia's proven gas reserves, which would be sufficient for another 30 years based on its current rate of production, Indonesia's gas production is stagnant. Aside from the present subsidies on substitute petroleum products, this stagnation is also the result of the price of natural gas at the wellhead, which is determined by the terms and conditions of the PSC. The Government, therefore, would like to review if some modifications in the terms and conditions of the PSC would be justified to make natural gas more competitive with substitute fuels, given the present economic circumstances, and promote increased production of natural gas.

8. In the downstream part of the sector, the potential is good for increasing small-scale use of natural gas as compressed natural gas as fuel for vehicles. This would result in considerable environmental benefits. Potential also exists for small-scale natural gas use in gas engines (and microturbines) to generate electricity in areas that are not connected to an electricity grid or to ensure power supply reliability in areas that are connected to an electricity grid but experience irregular supply of electricity. In particular, poor communities in remote areas without electricity but with natural gas resources and consumers who require a high reliability of electricity supply could benefit from such distributed power generation. Also, with the envisaged expansion of the gas transmission system, small-scale gas distribution to towns and communities could become viable. Additional gas production in Indonesia would also seem possible by extracting methane or coalbed methane (CBM), which is associated with underground coal seams. Geological survey data indicate that Indonesia has nine coal basins with good potential for CBM production with the most promising CBM resources located near existing gas pipelines in Sumatra. Alternatively, local towns and communities could use CBM for small-scale power generation and gas distribution. At present, Indonesia's recoverable CBM resources are estimated to be not less than 5 TCF and as high as 50 TCF. However, CBM development in Indonesia is hampered by the absence of an appropriate legal and regulatory framework, dispersed geological and reservoir data, and lack of analysis and evaluation.

9. In April 2001, the Government began eliminating its subsidies for petroleum products and increased the prices of kerosene, diesel oil, and fuel oil for industrial users[8] by about 70-200 percent, while the prices of the same petroleum products for export industries, international ships, mining companies, and oil gas producers were made equivalent to their international

[6] TA 2933-INO, *Implementing a Regulatory Framework for the Gas Industry*, for $565,000, approved on 11 December 1997, including supplementary financing of $386,000, approved on 28 December 1999.

[7] After approval of the law, further ADB assistance will be provided under TA 2933 for (i) strengthening the initial gas regulatory unit in MEMR and the subsequently envisaged gas regulatory commission, and (ii) preparing regulatory licenses for each gas industry activity.

[8] Electricity producers are currently exempted from those price increases but in October 2001 their prices for diesel oil and fuel oil will likely increase by a minimum of 50 percent.

prices.[9] The Government is planning to begin eliminating subsidies on petroleum products for other consumers such as commercial establishments and the general public in October 2001. Currently, the United States' Trade and Development Agency (USTDA) is assisting MIGAS with updating gas demand projections in various regions in Indonesia and developing technical standards for gas infrastructure facilities. USTDA's study will identify areas where expansion of gas distribution at the municipal level would be viable in the future. USTDA has agreed to make the data and findings of their work available to the TA consultants to incorporate priority areas for expansion of municipal gas distribution in the GSDP. Also, USTDA has expressed interest in helping promote gas infrastructure projects identified by the TA.

III. THE TECHNICAL ASSISTANCE

A. Objective

10. The objective of the TA is to prepare a comprehensive GSDP that will guide and promote the development of Indonesia's gas infrastructure over the next five years so as to meet the expected increased domestic demand for natural gas; reduce the consumption of imported and exportable substitute fuels, and the environmental impacts associated with the use of such fuels; and promote increased small-scale production and use of natural gas including CBM.

B. Scope

11. The TA will have two parts. The terms of reference are shown in Appendix 2. Under part A, activities will focus on the gas sector and include (i) assessment of Indonesia's potential for increased domestic utilization of natural gas; (ii) review of contractual agreements governing investments in natural gas production and processing, in particular the terms and conditions of PSCs; (iii) identification and prioritization of major gas infrastructure development activities that need to be undertaken to meet the increased demand for natural gas; (iv) assessment of economic and environmental benefits of increased domestic natural gas consumption in place of other fuels; (v) identification and evaluation of options for mobilizing the required investments for development of such infrastructure; (vi) assessment of the potential for increasing small-scale use of natural gas (including use of natural gas for distributed power generation and use of natural gas in vehicles as CNG); and (vii) development of a comprehensive GSDP.

12. Under part B, activities will focus on developing Indonesia's CBM resources and include (i) assessment of Indonesia's CBM potential for supplementing natural gas consumption; (ii) identification of options for development of a legal and regulatory framework for CBM exploration and development; and (iii) development of an action plan to promote commercial development of Indonesia's CBM resources.

C. Cost Estimates and Financing Plan

13. The TA is estimated to cost $615,000 equivalent, comprising $460,000 in foreign exchange and $155,000 equivalent in local currency. The entire foreign exchange cost of $460,000 and $30,000 equivalent of the local currency cost for a total of $490,000 equivalent, will be financed by ADB on a grant basis from the Japan Special Fund, funded by the Government of Japan. ADB financing will cover costs related to the remuneration, per diem, and travel of international and domestic consultants, and the Government's participation in the

[9] Exempt are producers of coal.

contract negotiations with the consultants; reports and communications; and computer rental and purchase of software. The Government will finance the balance local currency costs of $125,000 equivalent, as an in-kind contribution. Detailed cost estimates are presented in Appendix 3.

D. Implementation Arrangements

14. MIGAS will be the Executing Agency for the TA and will assign two staff to work with the consultants for Part A. Under Part B, the consultants will work with the CBM working group established by MIGAS. MIGAS will also establish and chair a working group comprising representatives from MEMR; PERTAMINA; MEMR's oil and gas research center, Lemigas; PGN; the Ministry of Environment; and the national planning agency, BAPPENAS, to discuss the findings of the consultants under parts A and B of the TA. During TA implementation, two seminars will be held together with interested bilateral and multilateral assistance agencies and private sector companies operating in the gas sector to discuss the preparation of the GSDP. MIGAS' staff will be trained in the use of the GSDP.

15. Part A and B of the TA will be carried out separately by two firms of consultants. International and domestic consultants will be selected in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for the engagement of consultants. Implementation of both parts of the TA will require about five months each and is expected to begin in September 2001. The consultants will submit inception reports within one month after the commencement of their services. Draft final reports will be prepared at the conclusion of the studies. The draft final reports will be discussed at the tripartite meetings in Jakarta with the participation of MIGAS, the consultants, and ADB.

16. Part A of the TA will require the services of five international experts (for about 10 person-months) and one domestic expert (for about 2 person-months). The five international experts should have experience in (i) assessment of natural gas utilization potential and contractual arrangement for natural gas production and processing; (ii) natural gas transmission and distribution; (iii) energy economics; (iv) gas infrastructure investments; and (v) natural gas use for CNG and distributed power generation. The natural gas transmission and distribution expert or the energy economist will act as team leader.

17. Part B of the TA will require the services of three international experts (for about 5 person-months) and one domestic expert (for about 2 person-months). The three international experts should have experience in (i) CBM resource assessment and CBM database development; (ii) development of legal and regulatory framework for CBM exploration and production; and (iii) policy development for commercial CBM production. The CBM resource and database expert is anticipated to act as team leader. The domestic experts under both parts of the TA should have experience in (i) collection and analysis of energy data, (ii) gas sector policy and gas sector operations in Indonesia, and (iii) gas infrastructure planning.

IV. THE PRESIDENT'S DECISION

18. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance, on a grant basis, to the Government of the Republic of Indonesia in an amount not exceeding the equivalent of $490,000 for the purpose of Preparing a Gas Sector Development Plan, and hereby reports such action to the Board.

Appendix 1

TECHNICAL ASSISTANCE FRAMEWORK

Design Summary	Performance Targets	Monitoring Mechanism	Assumptions and Risks
A. Goals			
• Increased domestic utilization of natural gas • Coalbed methane (CBM) exploration and development	• Increasing share of natural gas in the energy mix over the next five years • Reduction of the importation of substitute fuels	• National reports and statistics • Country and sector consultation missions	• Insufficient mobilization of required financing • Slowdown of reform process for petroleum sector • Economic slow down and decreasing growth in energy consumption
B. Purpose			
• Development of a gas sector development plan (GSDP) • Mobilization of required Investments for gas exploration, production, and infrastructure • Increased substitution of fuels for natural gas • Increased use of natural gas by small-scale consumers	• Increased investments in the gas sector • Increased foreign exchange savings • Air quality improvements in major cities • Increased number of small-scale consumers of natural gas	• Annual reports and statistics by the Ministry of Energy and Mineral Resources (MEMR) and the Ministry of Finance (MOF) • Air quality indicators • Annual reports and statistics by distributors of natural gas and compressed natural gas (CNG) • Investments in CBM exploration and production	• Inadequate implementation of the GSDP • Slow elimination of subsidies on substitute fuels
C. Outputs			
• GSDP for the next five years • MEMR staff trained to use the GSDP	• Implementation of the GSDP from the middle of 2001 onward • MEMR officials involved in gas sector development and CBM promotion trained as scheduled	• Tripartite review meetings and reports submitted by consultants	• Delay in obtaining relevant data and information
D. Inputs			
• Assessment of Indonesia's natural gas and CBM potential • Review of contractual arrangements for natural gas and CBM exploration and production • Evaluation of options for mobilizing investments for development of gas infrastructure • Assessment of potential for increased natural gas consumption by small-scale users • Strengthening legal and regulatory framework for CBM exploration and production	• International consulting services for 13 person-months • Domestic consulting services for 4 person-months • Local seminars • ADB financing of $490,000 equivalent, including $30,000 equivalent in local currency • Government contribution in kind of $125,000 equivalent for financing counterpart staff, office facilities, secretarial support, data acquisition and processing, and local seminars	• Tripartite review meetings and reports submitted by consultants	• Coordination and cooperation among the various Government organizations involved is satisfactory

OUTLINE TERMS OF REFERENCE

A. Part A - Natural Gas Sector

1. International Consultants

1. **Natural Gas Potential and Contractual Agreements.**

(i) Review all available information and data on the major gas fields in Indonesia; and estimate their remaining production potential for supplying natural gas for the domestic market.

(ii) Review the new oil and gas law and proposed legal and regulatory framework for the gas sector; and assess its impact on gas sector development.

(iii) Review changes in the natural gas reserves to production ratio over the last 10 years; and identify possible causes for such changes.

(iv) Review the present production-sharing contracts (PSCs) governing the exploration and production of Indonesia's oil and gas resources and estimate Indonesia's competitiveness in the region.

(v) Evaluate options for using other types of contracts, e.g., services or management contracts, to increase natural gas production.

(vi) Review the present terms of the PSCs governing natural gas production and in consultation with the energy economist evaluate options for changing the sharing arrangements including the introduction of a "sliding scale PSC" to increase natural gas production for the domestic market and maximize national economic benefits.

(vii) Determine the potential for investments in midstream facilities to increase natural gas production, evaluate options, and identify suitable standard contractual arrangements for such investments.

2. **Natural Gas Transmission and Distribution.**

(i) Review gas transmission and distribution infrastructure of Indonesia and available studies on expanding gas infrastructure, and identify bottlenecks that may occur over the next five years because of increased transmission and distribution of natural gas.

(ii) In consultation with the energy economist, identify the best scenario for expanding gas infrastructure over the next five years, prioritize sections to be developed and/or expanded, and provide general layout and cost estimates.

(iii) Identify general engineering requirements for expanding and integrating the gas transmission systems and the gas throughput rates on which this would be based, and estimate general construction costs.

(iv) Identify types of energy users that could benefit from switching to natural gas and estimate the trade-off between financial benefits and conversion costs.

(v) Review the present gas distribution activities, and in consultation with the energy economist, identify priority areas for increasing gas distribution assuming a gradual elimination of subsidies on substitute fuels.

(vi) Identify the engineering requirements for expanding gas distribution systems and the gas throughput rates on which this is based, the construction costs associated with expanding of gas distribution activities, and estimate the foreign exchange and local currency requirements for each identified priority area.

3. **Energy Economics.**

(i) Review the Government's plans to eliminate subsidies on substitute fuels and identify sectors and types of consumers interested in switching to natural gas assuming full elimination of subsidies or substitute fuels.

(ii) In consultation with the gas sector expert, review the terms and conditions of the PSC, determine the economic benefits of increased domestic natural gas consumption with subsidized substitute fuels, and determine if the economic rents received by local and central governments from gas production are justified in terms of maximizing national economic benefits, and if not, make recommendations for improvement.

(iii) Review the gas market updates, and assess the potential for increasing economic and environmental benefits when subsidies on substitute fuels are expected to be eliminated.

(iv) Review the Government's energy planning activities and objectives, develop scenarios for increasing domestic natural gas consumption, and identify environmental benefits and the economic conditions necessary.

(v) Compare the economic benefits of increased natural gas production for the domestic market with the economic benefits of exporting it as liquefied natural gas (LNG) assuming increased domestic demand for natural gas in the future.

(vi) In consultation with the gas transmission and distribution expert, determine investments required to expand gas infrastructure facilities to meet increased domestic demand for natural gas; assess the funding available from domestic sources and needed from overseas sources to make the required investments under each scenario; and in consultation with the gas sector expert, identify the most probable scenario for expanding gas infrastructure over the next five years.

4. **Gas Infrastructure Investments**.

(i) Review the proposed legal and regulatory framework for the gas sector and in consultation with team members, prioritize gas infrastructure construction activities for which investments need to be mobilized to meet the expected increased domestic demand for natural gas over the next five years and maximize environmental benefits.

(ii) Review the financing arrangements for existing gas infrastructure in Indonesia and planned for additional gas infrastructure, and evaluate their suitability for mobilizing the investments for additional gas infrastructure required during the next five years.

(iii) Review the domestic and international market conditions for mobilizing the required investments from private sources under the various investment schemes.

(iv) Identify impediments mobilizing private sector financing; make recommendations for relaxing these; and evaluate the suitability of public-private sector partnerships for financing the construction of gas infrastructure, and recommend how to structure partnerships.

(v) Assuming a gradual resumption of economic growth in Indonesia, assess how market conditions for attracting domestic and international financing for gas infrastructure development would change; and identify the additional options that would become available for attracting such financing and suitable financing packages.

(vi) In consultation with the gas transmission and distribution expert and the small-scale natural gas use expert, evaluate investment financing options for expanding natural

gas distribution networks and use of natural gas as compressed natural gas (CNG) in vehicles and for distributed power generation; and identify preferred financing options over the next five years.

(vii) Identify the preferred financing modalities for major gas infrastructure activities to be undertaken during the next five years to maximize private sector participation; recommend activities to promote their success.

5. **Small-Scale Natural Gas Use**.

(i) Review the use of CNG, including Government support; and identify impediments for self-sustainability and expansion.

(ii) Evaluate from an economic and environmental perspective the desirability and potential for expanding CNG utilization, and identify policy initiatives needed.

(iii) Estimate financing required to maintain and, if desirable, expand the present CNG production and supply facilities; and identify suitable financing modalities to minimize Government involvement.

(iv) Prioritize investments required to maintain or expand CNG utilization over the next five years and prepare a program to achieve the target.

(v) Evaluate the potential for distributed small-scale power generation based on natural gas taking into account the economic viability of such power generation and the projected elimination of subsidies on substitute fuels.

(vi) Identify areas with the greatest potential for distributed power generation and where the cost of electricity generated would be competitive with electricity supplied from other sources.

(vii) Review Government policies impacting on the increased use of small-scale distributed power generation based on natural gas; and identify possible additional policies or policy changes.

6. **Development of Gas Sector Development Plan (GSDP).**

(i) Review and discuss the findings of the part B consultants on Indonesia's coal bed methane (CBM) potential and options for development of a legal and regulatory framework and policies for CBM exploration and development in Indonesia.

(ii) Prepare a GSDP to (i) guide and promote gas infrastructure development over the next five years; (ii) integrate the action plan for promoting commercial development of CBM resources; (iii) recommend policy initiatives to promote the competitiveness of natural gas in the domestic market, mobilization of investments for additional gas infrastructure and the small-scale use of natural gas for distribution, distributed power generation, and vehicle fuel (CNG); (iv) prioritize gas infrastructure packages requiring investments over the next five years; (v) identify the preferred structure of the investment packages to maximize private sector participation; and (vi) promote the use of natural gas by small-scale users.

(iii) Install the GSDP in a computer; instruct staff of Directorate General of Oil and Natural Gas (MIGAS) on its use; and conduct workshops on the GSDP for private and public sector companies.

2. Domestic Consultant

(i) Help collect and analyze relevant energy supply and consumption data for Indonesia, and discuss with concerned agencies and Government bureaus to ensure their usefulness.

(ii) Review and analyze planned public and private sector investments for gas infrastructure and make an assessment of the most probable development scenario for the next five years.

(iii) Help identify and prioritize investment packages for gas infrastructure activities and identify policies needed to promote natural gas use by small-scale users.

B. Part B – Coalbed Methane (CBM) Sector

1. International Consultants

7. **CBM Resource Assessment**.

(i) Review all available information and data on underground coal seams, including laboratory tests and data analysis on specific types of coal.

(ii) Evaluate available information on coal basins, identify those with greatest potential for economically viable CBM production, and identify basic exploratory activities and corresponding investments needed.

(iii) Evaluate the desirability of developing CBM pilot projects, and if desirable, prepare a general outline and cost estimates for such projects.

(iv) Evaluate options for developing and maintaining a centralized CBM database; and propose procedures for submitting, storing, maintaining, retrieving, and processing of relevant data.

(v) Review the status of technological knowledge and know-how about CBM exploration and production; evaluate the desirability of strengthening Indonesia's research and development capabilities for basic CBM exploration and production techniques; and if desirable, prepare a program and cost estimate for such strengthening.

8. **Development of a Legal and Regulatory Framework for CBM Exploration and Production**.

(i) Identify the national and provincial government organizations involved in CBM exploration and production, and evaluate the suitability of the present legal and regulatory framework for promoting CBM exploration and production.

(ii) Review the terms and conditions of the draft PSC for CBM exploration and production, evaluate its suitability, and recommend any required strengthening.

(iii) Review the present concessions arrangements for coal exploration and production, and evaluate possible options for permitting CBM exploration activities in areas that are in a coal exploration phase.

(iv) Review the present national and relevant provincial fiscal and tax regimes that would be applied to CBM production in the most promising coal basins, and in consultation with the other team members, recommend appropriate national and provincial fiscal and tax incentives to promote CBM exploration and production.

(v) Evaluate options for the Government to undertake its regulatory and supervisory functions with regard to CBM exploration and production and evaluate the most effective option as well as the conditions and support required to make it operational, and propose bidding procedures for the award of PSCs for CBM exploration and production in priority coal basins.

9. **Policy Development for Commercial CBM Production**.

(i) Review the most likely scenario for developing Indonesia's gas infrastructure in consultation with the consultants under Part A of the TA, and assess contribution

CBM could make over the 10 years to supplement piped natural gas as well as to enable the use of methane for local, small-scale use.

(ii) In consultation with the other team members estimate the investment required for CBM exploration and production over the next five years to begin commercial CBM production by 2005.

(iii) In consultation with the legal and regulatory expert, evaluate policy options to ensure the mobilization of sufficient private sector funds, and identify Government agencies to implement the preferred policies.

(iv) Prepare an action plan for promoting the commercial development of Indonesia's CBM resources over the next five years, identifying (a) activities to prepare basic geological, physical, and chemical information of the coals in the priority basins, and if required, the pilot projects that will need to be undertaken to demonstrate the feasibility of CBM production; (b) the required strengthening of the legal and regulatory framework; (c) the promotional and fiscal policies that need to be adopted by the Government; (d) procedures for bidding and awarding PSCs for blocks with high CBM potential; and (e) annual targets for the action plan.

2. Domestic Consultant

(i) Help collect and analyze data and information to determine the CBM potential of coal basins; discuss usefulness with concerned agencies and Government bureaus.

(ii) Review existing CBM data, and propose procedures and arrangements for establishing a centralized database.

(iii) Help develop appropriate bidding procedures and PSCs for CBM exploration and production and identify appropriate Government policies to promote CBM exploration and production with the objective to begin commercial CBM production by 2005 at the latest.

COST ESTIMATES
($)

Item	Foreign Exchange	Local Currency	Total
A. Asian Development Bank Financing[a]			
1. Consulting Firms			
a. Remuneration	285,000	0	285,000
b. Per Diem	41,000	0	41,000
c. International Travel	50,000	0	50,000
d. Domestic Consultants	0	16,000	16,000
e. Domestic Travel/Transportation	0	10,000[b]	10,000
f. Reports and Communication	10,000	0	10,000
g. Computer Rental and Software Procurement	10,000	0	10,000
2. Observer at Contract Negotiations	4,000	0	4,000
3. Contingencies	60,000	4,000	64,000
Subtotal (A)	**460,000**	**30,000**	**490,000**
B. MIGAS Financing			
1. Counterpart Staff	0	30,000	30,000
2. Office Facilities	0	40,000	40,000
3. Secretarial Support and Communication Facilities	0	10,000	10,000
4. Data Acquisition and Processing	0	25,000	25,000
5. Seminars	0	20,000	20,000
Subtotal (B)	**0**	**125,000**	**125,000**
Total	**460,000**	**155,000**	**615,000**

MIGAS= Directorate General of Oil and Natural Gas
Source: Staff Estimates.

[a] Financed from the Japan Special Fund, funded by the Government of Japan.
[b] Domestic air and other travel costs of domestic and international consultants.