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USAID INDONESIA'S ENERGY STRATEGY
ENERGY FOR SUSTAINABLE GROWTH
(FINAL REPORT)

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ACRONYMS

ADB	Asian Development Bank
AMPRI	Association of Property Managers
APEC	Asia Pacific Economic Cooperation
APENDTINDO	Association of Renewable Energy Companies
AQMS	Air Quality Management System
BAPEDAL	Ministry of Environment, Indonesia
BAPPENAS	Ministry of Planning, Indonesia
BBM	Bahan Bakar Minyak
BPPT	Ministry of Science and Technology
COTR	Contracting Officer's Technical Representative
DGEED	Directorate General of Energy and Electricity Development
DHRI	Indonesia Hotel Association
DOE	U.S. Department of Energy
DSM	Demand Side Management
EE	Energy Efficiency
EEAF	Environmental Enterprise Assistance Fund
EETP	Energy and Environmental Training Program (USAID, Global Bureau, Center for Environment)
ESCO	Energy Service Company
FSN	Foreign Service National
GCC	Global Climate Change
GEF	Global Environmental Facility
GHG	Greenhouse Gas
GOI	Government of Indonesia
GTZ	German International Development Agency
IIEC	International Institute for Energy Conservation
IMF	International Monetary Fund
IPP	Independent Power Producer
IQC	Indefinite Quantity Contract
JUDP III	Third Jabotabek Urban Development Project
KONEBA	Konservasi Energi Abadi
LLI	Indonesia Environment Institute
LSDE	National Energy Laboratory
MDBs	Multilateral Development Banks
MFA	Maximum Efficiency Rates
MWO	Minimum Work Obligation
NEPO	National Energy Policy Office
NGO	Non-governmental Organization
OECD	Organization for Economic Cooperation and Development
OECF	Overseas Economic Cooperation Fund
PASA	Participating Agency Services Agreement
PGN	Perusahaan Gas Negara (national gas distributor)
PLN	Perusahaan Listrik Negara (national electric utility)
PVOs	Private Voluntary Organizations

SAL	Structural Adjustment Loan
SOE	State Owned Enterprises
SpO	Special Objective
SSM	Supply Side Management
TA	Technical Assistance
TOR	Terms of Reference
USAEP	U.S. Asia Environmental Partnership
USAID	U.S. Agency for International Development
WB	World Bank
YBUL	Yayasan Bina Usaha Lingkungan

EXECUTIVE SUMMARY

As Indonesia approaches the new Millennium, the future may look much worse to some than the past has seemed. The seemingly robust economy, first built and prolonged on the availability of indigenous low cost energy came tumbling down. Economic activity has fallen significantly since 1996 and the national currency, the rupiah, has fallen from 2,300 to the dollar to 18,000 in early 1998 and is now around 7,000 to the dollar. Urban unemployment is reaching epic proportions, many Indonesians are having a difficult time making ends meet and payments for energy is occupying an increasingly larger part of their shrinking budgets. Energy had been used as a tool of political influence characterized by inefficient pricing, rent seeking and lack of environmental consideration. *However, energy can be the engine of sustainable economic growth for Indonesia, as a national asset earning precious foreign exchange, by providing power to the highest valued industries, and as inputs for increasing health and education, thereby providing for the development of Indonesia's greatest asset – its people.* Energy is now both a major input to the economy and a major export and significant roadblocks are in place that will prevent Indonesia from taking full advantage of its abundant energy resources unless remedial action is taken now.

In the midst of the crisis, opportunities abound to put the country on the long run path to sustainable economic and viable development – opportunities that were resisted in the “good times”. These opportunities are real if planners and policy makers realize and internalize decision-making such that economic recovery, consideration of the environment, crisis mitigation and energy development are completely and inseparably bound together. Indonesians, with the help of USAID, can face the new millennium with abundant, reasonably priced energy provided that the right path is chosen now, and that short-run transitory gains are balanced against the long-term permanent gains.

A new future awaits and in this new future:

- Indonesians, both ordinary citizens and industry, will have reliable access to clean, low cost energy;
- There will be only a minimum level of government ownership of energy, significantly reducing the opportunities for misallocation of resources;
- New investment will flow from the private sector;
- Competition will exist in many energy subsectors and this competition will drive prices and production to their most efficient levels;
- Technical and non-technical losses will be minimized;
- Captive power is significantly reduced;
- Renewable energy and concern for the environmental impacts of energy become paramount in energy planning, operations and pricing;
- Monopolies such as electricity distribution and transmission are efficient suppliers and take consumer concerns into account in their operations and pricing;
- Consumers and suppliers invest in DSM and energy efficiency;
- Consumer interests will be protected through obligation to serve requirements and through other mechanisms such as lifeline rates for the poor; and,
- Energy is the engine for sustainable economic growth.

All of this is possible but not without conscious and deliberate action on the part of the Indonesian Government and not without the pivotal assistance of USAID. The latter is the subject of this paper. To take advantage of these opportunities, roadblocks must be overcome and USAID is already providing assistance that will facilitate removing them with its current CLEAN-Energy program. But the questions remain:

- (1) Do CLEAN-Energy activities remain relevant? And,
- (2) Are there additional activities as a result of the changing circumstances?

Barriers on the Road to Sustainable Development

In assisting Indonesia, USAID has two special objectives: (1) policy and economic reform, and (2) environmental protection. The first, a short-term objective, involves economic recovery and crisis mitigation and the second, a long-term objective of the energy office, involves principally greenhouse gas (GHG) mitigation and secondly mitigation of local pollutants. There are many common barriers on the road to economic recovery, crisis mitigation and environmental protection.

Economic recovery, if it is to be sustainable, requires efficient use of resources, just as *environmental protection requires efficient use of resources*. In the energy context, this means efficiency in the supply of energy [production, transportation, transformation (e.g., generation and refining), and distribution] and in the consumption of energy. Using more energy input than is necessary for a given energy output means more cost. Using more energy input for a given output of goods and services, again, is costly.

Beyond the private costs of inefficiency, there are significant costs to society. If more energy is used than is required, then: (1) society ends up using higher valued energy for lower valued uses with less for export now or in the future and a reduction in the consumption of other items; and, (2) more pollution is created than is necessary or desirable. This pollution has direct effects on the economic viability of the country either through its deleterious effects on people (increased morbidity and premature mortality), on material (either through deterioration or increased cleaning costs), or on the reduction in environmental quality, which is itself an input in the economy. So the recovery can be artificially accelerated by inadequate environmental concern but eventually this will lower the potential growth and in some cases even bring the system crashing down. Pay now or pay later but society will have to pay and conventional wisdom indicates that it is cheaper to incorporate environmental concerns into the process now than it is to remediate them after the damage is done.

Inefficiency arises because of several reasons.

- Prices do not reflect the choices the country makes in producing and consuming energy (opportunity costs);
- Government ownership and operation;
- Lack of Competition;
- Ground rules or enabling frameworks are not established or are not transparent; and,
- Market imperfections prevent adoption of energy efficiency on both the supply and demand side

All of these barriers are present in Indonesia, albeit to varying degrees. **Each of these barriers to sustainable economic recovery is also a barrier to environmental protection because ultimately they mean more energy is used than is necessary, which results in more GHGs and local pollutants.**

In a crisis, markets and people are often myopic. Precious assets are consumed rather than nurtured. This leads to less efficient use of energy (e.g., in a car, if oil is not changed as frequently as it should be, friction and heat increase and more fuel is consumed and/or more pollutants are emitted) and in some cases it leads consumers to switch from a cleaner fuel to a dirtier fuel. In some cases, people will reverse the transition from commercial energy to fuelwood and biomass. These types of reactions reduce the value of environmental/natural resource assets and/or increase society's costs from energy consumption. This, in turn, reduces the growth potential of the economy and can make growth unsustainable.

USAID's Approach to Energy

In choosing interventions under CLEAN-Energy, the Mission had several guidelines:

First, ***Build a foundation for sustainability and replicability.*** It is important that Indonesia restructure and reform in such a manner as to promote long run sustainable economic growth. Economic recovery can not be achieved unless commercial energy is readily available at reasonable cost. Economic recovery will not be sustained if prices do not reflect the true choices being made by Indonesia, including the environmental impacts, in the production and consumption of energy. Given the limited resources available, both in the donor community and the Indonesian economy, activities should lend themselves to being replicated so that the impact on the economy is the greatest.

Second, Build upon other donors' programs. CLEAN-Energy was designed to leverage other donors' investments by seeking that critical, pivotal area missing from their assistance package. USAID's funding is very limited and by itself is unlikely to cause major changes. Most assistance, despite its size, is rarely designed to meet all the needs of an activity or program. Sometimes this is by design while at other times it is because project design has missed some critical step. By piggy-backing on other donors' efforts, CLEAN-Energy can probably play a pivotal role. Thus, its marginal investment is that activity which will make the overall undertaking a success.

Third, Build on current trends. Don't swim upstream. CLEAN-Energy activities support the momentum of current policy, legal, bureaucratic and economic movements. In other words, CLEAN-Energy activities seek to work with the change that is taking place and to reinforce it. Experience has shown that it is difficult, expensive and time consuming to affect change unless some initiatives have taken place. CLEAN-Energy activities were designed to work where change has begun to take place such as in restructuring and private participation in the power sector. It is not designed to tackle problems such as subsidized end-use prices.

Fourth, Build on other CLEAN-Energy activities to reinforce the entire program. CLEAN-Energy activities were designed to build upon and reinforce each other. With a limited amount of

funds, leveraging is important but so is a design that tries to make each activity support and reinforce the other activities. One method to achieve this is to concentrate activities in one geographic area such as one Island or Utility service area (Wilayah).

Fifth, *Build on activities that make good economic and financial sense now.* CLEAN-Energy activities were designed as "no regrets" activities. Many of CLEAN-Energy's activities, while designed to focus on GHG reduction, are designed to make sense now. "For Indonesia no-regrets options focus on improving efficiency throughout the energy sector: production, delivery, and usage. Improved efficiency in both supply and demand sides reduces the amount of generation required to meet the same demand for services. Reduced generation reduces environmental impact and emission of GHG."

Thus CLEAN-Energy (CE) activities still remain relevant.

When CE was designed, the government was not willing to consider price rationalization or restructuring and regulatory reform of the oil and gas sector. As a result of the financial impacts of the Asian crisis and the resultant IMF and Asian Development Bank conditionalities, restructuring and reform are now very important. New activities can now focus on these two areas bringing the full spectrum of the energy sector under technical assistance and multiplying the impact of USAID's assistance. **By looking at the full spectrum of energy sector issues and focusing on the key areas of restructuring reform, new technical assistance activities that multiply the impact of USAID's efforts can be developed.**

Energy Activities

Based on these principles and the opportunities presented by the current crisis, the pivotal niche areas for USAID's energy assistance activities are: **to support policies that encourage competition and enable markets to be efficient, using regulation to overcome market imperfections, and to facilitate creation of the enabling frameworks that promote cleaner energy production and consumption, including renewable energy, and more efficient use of energy.**

As the state owned energy enterprises undergo restructuring, significant opportunities exist to build the policy and regulatory framework within which these and other energy entities will operate. It is important that regulation equally reward all types of productive investment activities so that utilities, for example, will invest in demand side management if reducing a KW or BTU of demand is more economic than increasing supply. Similarly, regulation and policy can positively impact the penetration of renewable energy. This area of assistance builds on policy trends and the trend in energy sector restructuring. The following activities, in order of priority, are recommended:

1. Energy Sector Policy/Restructuring and Capacity Building
1. Electricity Sector Reform
1. Oil and Gas Sector Restructuring
1. Energy Sector Subsidies Targeting and Price Reform
1. Supply Side Efficiency
2. Demand Side Efficiency

2. Renewable Energy Policy Support
2. Air Quality Improvement Program
3. Utility Partnership Program

These activities are discussed in greater detail in the main body of this report.

Conclusion

Energy, the economy and Indonesia's environment are critically linked. The recent crisis, unfortunate as it is, opens the possibility to expand USAID's Energy assistance in ways that will help put the economy on the path of sustainability and benefit all Indonesians. This strategy demonstrates that high impact but low cost interventions are possible in energy sector. Tightly targeted technical assistance to develop policy, legal and regulatory frameworks or to overcome market imperfections can have huge impacts on longer-term economic development issues. This avoids the often lengthy, costly and management intensive process of designing and implementing new distribution channels and delivery mechanisms needed to reach the ultimate customers in other USAID sectors.

USAID has a comparative advantage in this type of assistance and USAID assistance is leveraging past investments by the donor community, a \$400 million social safety net loan from the ADB and untold private sector investments in the energy sector. In essence, the cornerstone of USAID's assistance is technical assistance in facilitating market-oriented changes by providing enabling frameworks and using regulation to counter market imperfections. Other activities build or draw upon this enabling environment and promote opportunities for energy efficiency and renewable energy throughout the economy.

BACKGROUND

In 1996 USAID Jakarta undertook an extensive energy design program called CLEAN-Energy (CE) in support of the Mission's strategic long-term objective to reduce greenhouse gases. CE activities were designed to be "no regrets" activities or activities which reduced greenhouse gases and were justified purely on their economic impacts apart from Global Climate Change (GCC) impacts. The CE strategy was designed to be flexible, allowing for positive changes in the economy and changes in policy, legal and regulatory frameworks. However, since 1997, the economy and political system of Indonesia have been undergoing significant change in ways that could not be predicted when CLEAN-Energy was developed. For example:

1. The need for capital and the IMF conditionalities have made restructuring of the oil and gas sector a priority for GOI whereas before it was off limits.
2. Fuel costs to state owned energy enterprises have significantly increased because they are dollar denominated while most revenues that are rupiah denominated have not risen sufficiently. As a result, the viability of these companies and their ability to supply the market are being threatened. Incentives for energy efficiency and conservation have significantly increased but the companies do not have the financial resources to avail themselves of the opportunities.
3. The precipitous decline in the economy and the associated overwhelming humanitarian needs necessitated the development of short-term strategic objectives addressing crisis mitigation and economic recovery.

Given the changing needs and circumstances and the Mission's new short term objectives, a new energy strategy needs to be developed that addresses both the short term and long term objectives. The purpose of this report is to develop the Mission's revised energy strategy.

When the CE strategy was first designed, the situation facing the country was much different than it is today.

- First, the economy appeared to be strong and growing and Indonesians enjoyed a relatively moderate standard of living, albeit not sustainable.
- Second, there was political stability and strongly entrenched forces supporting the status quo.
- Third, oil and gas activities did not account for the lion's share of foreign exchange earnings. Restructuring and privatization were not on the Government's agenda. This sector was excluded from CE interventions.
- Fourth, fuel and energy prices were kept artificially low due in part for the need to retain political support among the masses and in order to sustain high natural resource export revenues (oil, gas, and timber). Thus, one of the principal drivers for demand side energy efficiency was not in place.
- Fifth, on a positive note the Government was taking steps to put an electricity regulatory structure in place and to begin restructuring the industry.

There are a number of important questions that must be answered in this evaluation, principal among which are:

1. To what extent do tradeoffs exist between the short run goals of crisis mitigation and economic recovery and the long run environmental goals? Can both be met simultaneously? If not, what guidance can be given to the Mission in choosing between these options?
2. As a result of changing circumstances and priorities, are there important interventions that can be considered now, that were not options when CLEAN-Energy was designed?
3. What guidance can be given to assist the Mission in choosing those interventions that meet today's needs without sacrificing the long run sustainable growth potential of the country?
4. What performance indicators should the Mission use in measuring the success of its interventions?

Following the introduction and background, the current situation of Indonesia's energy sector, the economy and environment and their relationship to the Mission's goals will be presented. This is then followed by a brief statement of donor assistance before the Mission's strategy is developed - including the targeted activities or interventions. The Mission's goals are then further defined in light of their potential interactions and the strategy is then evaluated with regard to its impact on the goals heuristically and in qualitative terms. This is followed by a more detailed development of interventions.

Since this strategy builds on and supplements the 1996 CLEAN-Energy design, the report will be viewed in terms of marginal changes from that strategy and so items such as what USAID has done in the energy sector will not be repeated here. Only those changes that have taken place since the CE design will be presented. The 1996 CE design document is available from the Indonesian Mission and will, therefore, not be included in this report.

ECONOMY, ENERGY, AND THE ENVIRONMENT

The Economy

At one time Indonesia was part of the East Asia miracle. It was an economy built at first on abundant, high quality natural resources including oil, natural gas and coal. Later the economy diversified away from primary energy to manufacturing – but economic growth was nonetheless sustained on subsidized energy. Now Indonesia is experiencing significant problems. Business declined in the latter half of 1997, the Indonesian economy has gone in to deep recession. Inflation soared (prices rose nearly 78 percent in 1998¹); the local currency, the rupiah, suffered significant devaluation; interest rates continued to increase and the values of the country's assets declined sharply. Gross Domestic Product dropped nearly 14 percent and the productivity of both the industry and the service sectors declined. Construction and manufacturing industries were the hardest hit. Export industries, the country's backbone for the last two decades' impressive growth, could not meet the foreign exchange requirements of the country due to a lack of worldwide demand, credit constraints, and reduced international oil and commodity prices.

The social impact of the crisis has also been severe. Unemployment in the urban markets increased by 60 percent and rural unemployment increased by approximately 25 percent. The incidence of nationwide poverty reached close to 20 percent in 1998, which represented 18 million additional people below the poverty line as a result of the crisis.

In 1997, the International Monetary Fund (IMF), and the Government of Indonesia (GOI), began discussions for a \$43 billion bailout package, linked to GOI economic reform programs – including the abolishment of fuel subsidies by the end of 1999. The social unrest in 1998, in addition to the economic depression, further eroded investor confidence resulting in capital flight. Since the late part of 1998, the government has shown the desire for a strong and sustainable commitment to address the economic crisis, bringing recovery and helping to stabilize the economy. Some of the specific actions taken by the GOI include: (i) adopting tight monetary policy; (ii) fiscal expansion to strengthen social safety net provisions; (iii) structural reforms; and (iv) corruption mitigation.

One of the biggest challenges facing the government is to implement actions to reduce the adverse social impacts of the economic crisis without sacrificing its future too heavily. The GOI has begun the process of strengthening the social safety net. For example, in July 1998, the government revised its budget and increased allocations for subsidies of basic commodities and services for poverty reduction activities. Since late 1998, there has been significant improvement in the country's key macroeconomic indicators – but this improvement is fragile! For example, the rupiah has strengthened; the stock market has recovered substantially; and interest rates have also declined. In order to continue to maintain economic stability and the recovery process, the GOI needs to continue implementing sound fiscal and financial policies and overall government reform. **Note that this recovery has been aided and maintained on artificially low energy prices. The long-term, sustainable economic growth of Indonesia cannot be assured unless this is corrected.**

¹ U.S. Department of Energy, Energy Information Administration, January 1999.

In 1999, the GOI went through a major bank sector restructuring process. In February 1999, in consultation with the IMF, the government closed 35 banks to further restructure the sector. Additionally, the government has accelerated the process of regulatory reform in other sectors. For example, in addition to the Bank Restructuring Law, the government has initiated an Oil and Gas Law, both of which are in the Parliament. The Parliament recently passed Anti-Monopoly and Competition Law, creating the legal framework to allow for more competition in various productive sectors of the economy. The Parliament is also debating an Anti-Corruption law.

Despite the various actions by the government, the reform process continues to be slow as many of these policies need time to take effect and require detailed implementing rules and regulations (IRRs) to be written before investors will return and the benefit of these new laws and policies can be seen. The Consultative Group for Indonesia (CBI) continues to have an on-going dialogue with the government to assist the country in increasing external funds to reduce budget shortfalls. Other donors, such as the World Bank and the Asian Development Bank (ADB), and bilateral donors are working closely together to address Indonesia's recovery process.

The Energy Sector

The importance of energy to Indonesia's economy cannot be overstated. Oil and gas exports are Indonesia's largest source of foreign exchange and government revenues or 35 percent of total export earnings and 30 percent of government revenues in 1998². Indonesia's natural gas reserves of 72.3 trillion cubic feet are ranked as the 13th largest in the world. It has proven oil reserves of 5 billion barrels ranking it in the top twenty oil countries. Additionally, Indonesia has 3.1 percent of the world's coal reserves or about 32 billion tons³. Indonesia has taken steps to move into value added energy products with nine refineries (about 1% of world refining capacity) and Liquefied Natural Gas (LNG) export facilities.

Due to the fiscal crisis, commercial and direct foreign investments in the energy sector have halted. Cash flow from continuing operations in the energy sector are insufficient to cover costs, let alone investment, leaving only the multilateral development banks (MDBs) as sources for investment/financing. The MDBs require two forms of change in Indonesia's energy sector: (i) sector reform (local level participation away from centralization); and (ii) privatization (sale of traditionally held government assets in both generation and distribution).

Privatization and sector reforms will encourage and require increases in prices and removal of most subsidies. If Indonesia conforms to the traditional model as subsidies diminish there will be a sharp surge in prices before a leveling off as the production-to-output ratio is enhanced through efficiency gains. Following an increase in fuel prices of approximately 72 percent riots broke-out in May 1998. The Government reinstated fuel subsidies and lowered fuel prices, although not to their original levels and a second, "planned" rate increase was postponed, as such an increase would have potentially lead to more civil unrest.

² U.S. Department of Energy, Energy Information Administration, January 1999.

³ British Petroleum World Statistical Review

The crisis has brought about a major change in the structure of the economy. The role of oil and gas as Indonesia's export commodity and foreign exchange earner will have to be significantly enhanced as the role of non-oil exports has significantly declined due to a recession in the manufacturing sector. The fall in the rupiah exchange rate has resulted in great difficulties in the domestic energy sector, as the sector must pay international market prices for fuels with a rupiah that has lost more than 70 percent of its value in the international market.

The adequate availability of energy at affordable prices is vital to reducing the economic decline and maintaining an acceptable quality of life and social equity in the country, both during the crisis and during the recovery period that may last several years. Any disruptions in energy supply or sudden price increases could lead to social unrest, as evidenced by the riots in May 1998 when the Government of Indonesia (GOI) announced sharp increases in energy prices. The need to keep energy prices under control coupled with the sharp decline in the value of the Rupiah has widened the gap between energy production costs and revenues for the state-owned energy producers and distributors, making them even more unprofitable and ineligible for foreign investment.

The energy sector in Indonesia continues to be owned and managed by government enterprises. Production, transmission and distribution of oil, gas, geothermal and electricity are monopolized by the Central government through State Owned Enterprises (SOEs), primarily: PGN (Perusahaan Gas Negara - national gas distributor), PLN (Perusahaan Listrik Negara - national electric utility), and Pertamina (national gas/oil producer). Although SOEs play a significant role in the coal sector, there are a few private sector sellers and buyers, which has led to some competition in this subsector. In addition, some private power generation has been introduced in the electricity sector. As in other sectors in Indonesia, such a monopolistic environment has nurtured inefficiencies resulting in artificially high costs. The current economic crisis has exacerbated the problems faced by the SOEs and will seriously inhibit a rapid recovery. The GOI has recognized the urgent need to address these issues through the improvement of energy sector efficiencies in the country.

In the immediate time frame, the GOI has no option but to consider some form of subsidies for fuel oil to address the difference between energy production costs (tied to the costs of fuel and equipment) and the domestic selling price. Most of the cost components of oil, gas, and electricity are dollar denominated, while the revenues are in rupiah. Therefore, the SOEs responsible for the production and distribution of energy will not be able to survive without massive subsidies from the GOI to close the gap between costs and revenues.

Some of the estimates for subsidy requirements of the SOEs are as follows:

- PLN's delivered electricity cost is about \$0.06 US per unit, while the average revenue is presently about \$0.02 US. PLN will need a subsidy of approximately US \$8 to \$13 billion in the next two years in order to continue to provide electricity to consumers.
- PGN is in an even worse situation: Unlike PLN, which has a relatively diversified fuel supply (hydro, oil, gas, coal, and geothermal), PGN is dependent on gas purchased from Pertamina at international market prices in U.S. dollars. PGN must then sell the gas in

rupiah at prices set before the crisis -- with little hope of being able to sell at rationalized prices in the near future.

Pertamina may be in a better position as its foreign currency earnings from the export of oil and gas can balance the cost of production and domestic distribution of products. The subsidy for kerosene, the largest in Indonesia, provides an interesting case. The official price at the Pertamina Depot is Rp. 280/liter. However, low-income people in Jakarta have to pay around Rp.500/liter, almost double the official price, the difference resulting from a long distribution chain in the kerosene market. The price outside of Jakarta and Java is even higher as the transportation chain lengthens.

The total subsidy required for basic survival of the energy sector will be staggering, and it comes at a time when the GOI is least able to afford it. Consequently, the amount of subsidy will be limited and the allocation of subsidy will require careful targeting to needy, lower income groups.

The Oil and Gas Sector

Indonesia currently has proven oil reserves of about 5 billion barrels, a 14 percent decline in proven reserves since 1994. Most of Indonesia's oil is located onshore in Central Sumatra, the country's largest oil producing province. Other significant oil field development and production is located in accessible areas such as offshore northwestern Java, East Kalimantan, and the Natuna Sea.

During 1998, Indonesian crude oil production remained flat at about 1.3 million barrels per day (bbl/d). The country also produces approximately 180,000 bbl/d of natural gas liquids and lease condensate bringing the country's total oil production to around 1.6 million bbl/d. Indonesia is the only Southeast Asian member of OPEC. Indonesia's recent oil production has remained relatively flat as introduction of crude streams from new, smaller fields has helped compensate for declines at many of the country's mature oil fields.

To increase production, Indonesia has stepped up efforts to sign new oil exploration contracts. The government has estimated that it will need \$3.5 billion or more per year to locate new oil and gas deposits. New exploration will be in frontier regions, particularly in eastern Indonesia. Pertamina has awarded 22 new oil contracts in 1998 compared with 28 in 1997 and 13 in 1996.

Natural Gas

Indonesia is ranked thirteenth in the world with proven natural gas reserves of 72.3 trillion cubic feet (Tcf). Most of the country's gas reserves are located in North Sumatra, in smaller fields offshore Java, a number of blocks in Irian Jaya, and the Natuna D-Alpha field, the largest in Southeast Asia. Despite its significant gas reserves and its position as the world's largest exporter of liquefied natural gas (LNG), Indonesia still relies on oil to supply about 60 percent of its energy needs. As Indonesia's oil production has flattened in recent years, the country has tried to shift towards using its natural gas resources for power generation. However, the domestic gas market is still considered immature and the country lacks a domestic network and pipeline infrastructure to provide widespread distribution.

Pipelines

The Indonesian government, through the State Gas Company (PGN), is currently planning to establish a network of pipelines to facilitate distribution of natural gas supplies to consumers. For instance, there is now a plan to optimize the utilization of gas supply by constructing pipelines to transport supply from the South Sumatran gas fields to West Java. Another plan is to lay pipelines from the Asamera Corridor Block, also in South Sumatra, to the Duri oil fields in Central Sumatra to be utilized in the Enhanced Oil Recovery project. This pipeline grid will eventually be extended to Batam Island.

Refining

Indonesia has eight refineries with a combined capacity of over 900,000 barrel per day. Financial problems are plaguing the refining sector as a result of the country's economic crisis. According to *Platt's Oilgram News*, Samto Utomo, Pertamina's director of processing says that Indonesia's refined products demand has fallen by about 10 percent, while demand for jet fuel is down more than 20 percent in 1998. Recently, the government granted tax holidays of 10-12 years to investors building new oil refineries outside Java. Local media reports indicate that the government announced the issuance of new licenses to 16 investors to build oil refineries.

The Coal Sector

Indonesia has almost 6 billion tons of recoverable coal reserves, of which 85 percent is lignite and subbituminous and 15 percent is anthracite and bituminous. Sumatra contains roughly two-thirds of Indonesia's total coal reserves, with the balance located in Kalimantan, West Java, and Sulawesi. In 1996, Indonesia exported 40.2 million short tons (Mmst), or about 76 percent of its coal production. The majority of these exports are destined for Japan, South Korea, Taiwan, and Hong Kong.

Indonesia's current economic crisis has had a mixed impact on the country's coal industry. On the one hand, Indonesian exports of coal dropped in 1998 due to lower regional demand. More importantly however, mine operators have actually profited from the depreciation of the rupiah because most of their products are exported in dollars while operational costs are paid in rupiah.

The Power Sector

The Ministry of Mines and Energy (MME) in Indonesia is responsible for developing and implementing the energy sector policies in the country. The Directorate General for Electricity and Energy Development (DGEED), part of the MME, is the regulatory authority. PLN is the state-owned national utility charged with the responsibility for the operations of the power sector. The Ministry of Empowerment of State-owned Enterprises exercises the sole shareholders' power on PLN on behalf of the GOI.

Indonesia's total installed capacity in 1998 reached approximately 21,000 MW of which 18,000 MW was thermal generation and the bulk of the remainder being hydro. The Java-Bali grid constitutes the largest electricity market in the country with the remainder being isolated island systems ranging from some large thermal plants to small diesel generators in most islands.

In October 1995, the generating assets of the Java-Bali Power Grid were divested to two wholly owned subsidiaries for power generation in Java-Bali. These subsidiaries are Pembangkitan Java-Bali I (PJB I) and PJB II. PLN has entered into 15 power purchase agreements (PPAs) and

11 energy sales contracts with Independent Power Producers (IPPs) for the purchase of a combined 11,015 MW of new electricity. Prices for private power range from around US \$0.055 per kWh to over US \$ 0.008 per kWh. The PPAs, in general, require PLN to pay for the power purchase a rate linked to the prevalent exchange rate and guarantee minimum off-take for a period of 30 years. Given the unreliability of electricity in Indonesia, various donors have estimated that in addition to the installed capacity of PLN, there is more than 9,600 MW of self-use or captive power capacity⁴ throughout the country, often resulting in high economic costs and certainly in high environmental costs.

Often total capacity statistics can be misleading and this is the case in Indonesia. This stems from the fact that there is no single grid tying the country's electricity suppliers with those demanding power. There is excess capacity on Java-Bali and this surplus will continue for the foreseeable future. However, in many of the Islands there is a persistent shortage, a shortage exacerbated by the change in fuel subsidies and one that is unlikely to be easily resolved unless stern, deliberate measures are taken.

Power Sector Policy Issues

Beginning with the Electricity Law No. 15/1985 which mandates the government to ensure that adequate supply of electricity is available to all consumers through the PLN operations, the GOI has taken a number of important steps in policy and sector reform.

First, the Electricity Act was passed (Law No. 15 of 1985), which allowed participation of private power producers, distributors and licensees. Yet, little or nothing happened other than the growth of captive power.

Second, the Electricity Act was followed by the formation of a National Committee for Energy Conservation in 1990.

Third, a 1991 Presidential Decree on Energy Conservation "instructed relevant ministries and agencies to promote energy conservation by establishing efficient energy prices, providing credit facilities for energy conservation activities, disseminating energy saving information, conducting energy audits and incorporating energy efficiency in equipment standards."

Fourth, the Presidential Decree No. 45 (1991) greatly enhanced the opportunities for private geothermal investment by allowing private investors to also construct power plants associated with their geothermal investment.

Fifth, to open the way for large scale private power, a Presidential Decree in 1992 (No. 37) authorized Build Own Operate IPP-type investments. This decree sparked a flood of IPP investment.

⁴ Source: Clean-Energy, 1996.

Sixth, a Ministerial Decree in January of 1993 required all Government agencies with more than 200 kVA of generating capacity to establish an energy management program and specifically appoint an energy manager to handle such activities.

Seventh, the Ministry of Mines and Energy (MME) Policy Guidelines of 1994 commits the Government to: improving the performance of PLN through restructuring, decentralization, commercialization and corporatization; structuring electricity tariffs to more closely reflect the economic costs of supply; reforming and refining the regulatory and institutional framework to foster competition and facilitate increased and more efficient private sector participation; enabling equal access to primary energy sources at market determined prices for all generators; and to develop and implement appropriate measures for inducing energy conservation and improving environmental protection.

Eighth, the Government established the small producer power agreement to promote the use of small renewable energy sources. This provision is also extended to IPPs under contract to PLN. Government Regulation No. 10/1989 describes the basis for supply and utilization of electricity. In addition, Presidential Decree No. 37/1992 describes the regulatory framework for private power participation in Indonesia's electricity sector. The Presidential Decree No. 7/1998 describes provisions for the government to use a competitive bidding process for the implementation of all infrastructure projects.

Ninth, as mentioned above, the generating assets of the Java-Bali Power Grid were divested to two wholly owned Gencos or generating companies.

In the last two years the pace of the reform process has quickened. In February 1998, the GOI created a Power Sector Restructuring Committee, consisting of representatives from various departments, to act as a high level body for sector policy intervention. In August 1998, the Minister of Mines and Energy established the Power Sector Restructuring Policy. This policy was formally released on August 5, 1998 and is enclosed as Annex III to this report. Specifically, the government's policy has several objectives:

- (i) Provision of high quality and reliable electricity to all consumers;
- (ii) Enabling PLN to act as a financially independent body;
- (iii) Unbundling PLN and creating a competitive electricity market in Java-Bali;
- (iv) Gradually increasing electricity tariffs to achieve full-cost recovery;
- (v) Allowing for and expanding the participation of the private sector;
- (vi) Reforming electricity regulation; and
- (vii) Establishing a bulk power market based on a multiple buyers and sellers model by the year 2000. These plans were transformed in December of 1998 when the Government put forth an implementation plan.

Restructuring of the power sector is a critical objective of the GOI given the current inefficiencies in the sector and the demand patterns throughout the country. Although, currently, PLN has surplus generating capacity on the Java-Bali grid, much of the rest of the country faces a power deficit. In fact, given the insufficient investment in transmission and distribution, the Java-Bali markets have excess demand even in the face of surplus generating capacity. As the

economic recovery begins, demand for energy begins to grow and the government's reform policies begin to show results, it is anticipated that enabling frameworks will be in place to provide incentives to the private sector to create new capacity to fuel the economic growth process⁵. Therefore, in concert with the donor community, the GOI is committed to the implementation of the restructuring of the power sector. As part of its commitment to the implementation of its restructuring policy, the GOI has requested financial advisory and capacity building assistance from a number of donors including the World Bank, the Asian Development Bank, and USAID.

PLN's Financial Performance

In recent years, PLN's financial performance has been poor. For example, in 1997, PLN incurred losses of Rp. 580 billion. PLN's rate of return on net fixed revalued assets was only 3.5 percent, less than half of the rate specified in loan covenants with the Asian Development Bank since 1995. PLN also did not meet its debt service coverage covenant of 1.5 in 1997; it was 1.3. This dismal performance is largely a result of low tariffs and PLN's increased debt service liability. One of the main problems was that despite international pressures, the average electricity tariff increase implemented by the government, was only 8 percent during the period 1994 to 1997.

In 1998, PLN's financial performance was even worse. Preliminary financial statements prepared by accountants assisting PLN indicate that PLN's losses may reach Rp. 3.3 trillion from the Rp. 580 billion level in 1997 - a six fold increase in one year. The rate of return on net fixed revalued assets is expected to be minus 4.4 percent. One of the key reasons for this is the increase in the cost of fuel and geothermal steam. The government provided a subsidy of approximately Rp. 2 trillion to the PLN to barely maintain PLN's cash flow and sustain its operations.

The Current Crisis, Tariffs, and Market Competition

During the mid-1990s, the government was able to attract a number of private power developers to the growing power market in Indonesia. Therefore, in anticipation of new capacity to be generated through IPPs, the government had significantly reduced its investment in the power sector. The sustainability of the power sector (with revenues in local currency) has been supported through investments in foreign currencies. The devaluation of the local currency, therefore, has sharply increased the debt service burden of the PLN. This debt service burden can only be reduced through tariff increases to account for both (i) the sharp difference between production costs and price levels, and (ii) some of the 70 percent devaluation of the local currency. At the same time, the sharp inflation, high unemployment, and reduced economic activity, have created an enormous opposition in the public for any future price increases. As a result, both PLN and the government are incurring massive budget deficits in order to continue to maintain an adequate level of power supply. Since the government is the sole owner of PLN, it bears the responsibility for all of PLN's losses and financial risks.

⁵ Of course, experience has shown that unless the donor community steps forward to provide technical assistance to put the enabling frameworks in place, that they will not be in place at the right time or in the right manner to ensure optimal expansion of the system. USAID assistance has and will remain pivotal in this regard.

During the economic crisis recovery period, the foreign donors have been active in funding part of the investment in the power sector. At the end of 1997, hard currency loans to PLN amounted to approximately 20 percent of the total share holders' equity and liabilities. The government and PLN share the foreign exchange risk for this investment. In addition to the above, some of the gas purchases for the new combined cycle power plants are also linked to foreign currency to protect the foreign gas developers. The financial problems of PLN can and should be addressed through appropriate tariff increases. Under the law, the government has the authority to implement additional tariff increases, but social circumstances make it very difficult for the government to implement any price increases at a time when social impacts are at their peak. The Asian Development Bank, as part of the US \$400 million Social Safety Loan, is providing technical assistance to the government to build public acceptance for future tariff increases.

Currently the government is subsidizing PLN in lieu of tariff increases. However, the IMF is routinely monitoring the government's expenditures, including subsidies to the SOEs (e.g. PLN). These subsidies cannot continue for an indefinite time and tariff increases will have to be implemented for revenue recovery. This is also needed because over the long term the government needs to introduce competition in the power sector and allow for IPPs to generate a substantial portion of the country's electricity requirements.

The size of PLN's tariff increases is closely linked to the cost of power purchase from the IPPs. This is estimated to be approximately US \$3 billion per year by the year 2001.

As more and more competition is introduced in the power sector, it is anticipated that generation efficiency will grow. But to ensure that transmission and distribution are efficient will require regulatory mechanisms designed for that purpose. If distribution companies are given the proper incentives, then they will be indifferent at the margin between supplying a kilowatt hour or helping reduce their customers' demand. This will give rise to new markets for energy efficiency options such as Demand Side Management (DSM).

On average, electricity prices must increase and this would have to happen whether or not the private sector becomes part of the electricity equation. (Tariff rationalization may lower prices for some consumers such as commercial users.) With prices increasing, it may appear counterintuitive that consumers will benefit, but benefit they will. First, they will have a dependable supply of power – an advantage for manufacturing. Second, scarce national resources can flow to more important uses where the benefits of public provision are long recognized such as health and education. Third, as production and consumption of electricity becomes more efficient, local pollution will decrease and with it comes a reduction in associated morbidity and mortality. This is in addition to the GCC benefits. Fourth, as prices rise and/or efficiency grows, demand will be reduced from what it otherwise would be and as Indonesians need less energy for their own use, more will be available for export – earning much needed foreign capital.

Rising prices also provide an incentive for captive generation unless measures are taken. In conjunction with tariff rationalization, the GOI must couple this with other price (fuel) and regulatory mechanisms to reduce captive power. There are important reasons to deal with this issue openly and immediately. As prices rise, all other things remaining the same, industry and

commercial users will increasingly turn to captive generation because of subsidized diesel fuel. This means reduced revenues for distribution companies, imposing a higher burden on the remaining customers. A vicious cycle begins. Because distribution companies have reduced revenues, the revenue burden will fall on the remaining customers and this in turn provides increasing incentive for captive generation and reduced revenues. Additionally, captive power is expensive for the country in both economic and environmental terms. This is one area where USAID assistance will be critically important.

All of this requires the government to create a sound business environment in terms of laws, competition, contract terms, financial markets, and bankruptcy codes or the enabling framework. It will also require a regulatory body to guide and monitor the monopolistic sectors. In turn, this will require donor assistance.

The Energy-Economy-Environment Nexus⁶

The environmental consequences of energy production and use are often thought of only from the perspective of burning fossil fuels to produce energy. However, the complete environmental impact of energy activities is much more complex and covers all related activities from the extraction of energy resources, refinement of resources to produce fuels, transportation of fuels, storage of resources and fuels, energy production from fuels, and delivery of energy services. It is not simply the coal that is burned but also the energy needed to operate the coal mining equipment, transport the coal, improve coal quality, convert the coal from a fuel to electricity through boilers and turbines, deliver the electricity over transmission and distribution lines, and finally transform that electricity into energy services.

As coal is mined, forests are cleared and in the process there is loss of habitat and biodiversity, soil erosion, methane emissions, dust spread on the winds and leachate. Energy is used to mine the coal. Occasionally, the coal is improved by removing ash, sulphur, or moisture to make it a higher-quality fuel. Indonesia is lucky in that most of its coal is low in sulphur and ash, although there is a high moisture content in most of the coal. The coal is then transported and in the process energy is again used (oil from bilges is spilled in the sea) and, coal dust again enters the air. At the power plant, the combustion of coal causes thermal pollution, discharge of water containing heavy metals, and emissions of nitrous oxides, sulphur dioxide, particulate matter and carbon dioxide and solid waste from fly ash. The clearing of land for transmission facilities can also contribute to land degradation and transmission at high voltages cause electromagnetic radiation. Moreover, inefficiencies in transmission and distribution (T&D) contribute to more energy being generated than would otherwise be necessary.

For Indonesia, current T&D losses average a little more than 12 percent. This means that for every 100 kWh of final demand, approximately 113 kWh must be generated. Reduction of these losses to 10 percent could mean a reduction in air pollutants of 1.1 million tons of carbon dioxide equivalents, 7,400 tons of SO₂ and 4,300 tons of NO_x each year. The inefficiencies at every step in the energy cycle multiply the amount of fuel needed to supply the energy services delivered to the consumer. This multiplier for the fuel required increases the emissions proportionately. It is

⁶ This section draws heavily on the CLEAN-Energy design document. What was relevant then for this nexus is still relevant.

only in considering the complete environmental impact of fuels that society can make the best decisions about the costs and benefits of energy and allocate its resources among energy sources.

The environmental consequences of energy activities have not been fully addressed in Indonesia. The country is already facing serious energy-use related natural resource degradation in areas where coal is mined and serious urban air pollution problems. Discussions with key Ministry of Environment (BAPEDAL) staff and written sources confirm that levels of suspended particulates, carbon monoxide, lead, and nitrous oxides in congested urban areas are above World Health Organization (WHO) ambient air quality levels. Ambient concentrations for Jakarta are presented in the table below. Ambient air quality exceeds recommended WHO standards for all pollutants except Ozone.

Pollutant	Sampling Time	Jakarta Ambient Levels	Recommended WHO Levels
Suspended Particulates $\mu\text{mg}/\text{m}^3$	24 hrs	286	50
Sulphur Dioxide ppm	24 hrs	0.10	0.04
Carbon Monoxide ppm (a)	8 hrs	20	9
Ozone ppm (a)	1 hr	0.10	0.10
Nitrous Oxides $\mu\text{mg}/\text{m}^3$	24 hr	140	100
Lead $\mu\text{mg}/\text{m}^3$	Avg. Annual	2 - 60	0.5 - 1

Sources: World Bank, Policy Working Paper: Estimating the Health and Economic Effects of Air Pollution: Applications to Jakarta and Mexico City, 1995. (a) World Bank, Air Quality Management: Considerations for Developing Countries, 1995.

BAPEDAL emission inventories indicate that motor vehicle consumption of fossil fuels accounts 44 percent of SPM, 89 percent of hydrocarbons, 100 percent of lead, and 73 percent of NOx emissions in Jakarta. "In Surabaya, the shares are 13 percent, 71 percent, 100 percent and 34 percent, respectively. Industrial activity, including power plants, are the second largest source of urban air pollution problems.

Transboundary pollution from energy, which includes acid rain and GHG, is also important in the Indonesian context. This stems from Indonesia's abundant tropical rainforests, hydrocarbon energy resources and the growing conflicts between carbon sinks and sources. Total energy use carbon dioxide emissions in 1992 were 151.3 million metric tons or about 0.8 percent of world energy use emissions. The implications are that barring major changes in the economy and energy patterns, Indonesia's contribution to GHG will grow significantly as its economy grows.

Indonesia is an energy rich country and conventional energy is a mixed blessing to Indonesia, as it is to most countries. On the one hand, it offers attractive foreign exchange earnings and fuels domestic growth. Subsidized energy temporarily fuels the domestic economy. The inefficient production and consumption of coal, oil, and other energy contributes significantly to natural resource and environmental degradation at a local level and to the more diffuse global

(transboundary) concerns of greenhouse gases. This environmental damage costs the country and is a weight on its long run sustainable economic growth. Increased pollution adds to the costs of cleaning. Increased morbidity and mortality associated with pollution increases medical costs, reduces worker productivity and removes workers prematurely from the labor market. Lower energy prices, increases demand and means that high valued energy assets are used for low valued uses. There is less energy for export or less energy for future domestic consumption. Energy, the environment and the Indonesian economy are inextricably tied together. Used properly energy can be the engine of long run sustainable growth. Used improperly energy provides a quick spurt of growth that ends in more damage than the benefits it created.

SUMMARY OF CURRENT ACTIVITIES OF THE DONOR COMMUNITY

The power sector in Indonesia has received significant financing from the two largest donors -- the Asian Development Bank and the World Bank. Since 1971, the Asian Development Bank has completed 25 loans in the energy sector in Indonesia totaling US \$2.7 billion. In addition, ADB has provided 31 TA grants to the government totaling over \$11 million. Recently, ADB has approved a Social Safety Net Loan in the amount of US \$400 million including US \$20 million for various technical assistance programs for electricity sector restructuring, capacity building, and the establishment of a competitive electricity market.

The World Bank has provided a number of loans to the PLN in the transmission and distribution area. Currently, the Bank is preparing a US \$300 million Structural Adjustment Loan to continue to support the government's economic recovery process. The World Bank is also currently considering a TA to appoint management consultants to assist PLN in the creation of new generation and distribution companies as the power sector goes through the unbundling process. The World Bank and ADB have, in principle agreed, that the World Bank will focus on the corporate side of the power sector restructuring and ADB will focus more on the public and regulatory process.

Other bilateral agencies have also contributed to the development of the power sector in Indonesia. They include the Overseas Economic Cooperation Fund (OECF) of Japan, Export-Import Bank of Japan, Kreditanstalt fur Wiederaufbau of Germany, and the U.S. Agency for International Development. The German International Development Agency (GTZ), once a major energy donor, is no longer involved with the exception of a microhydro project.

USAID Indonesia

Currently USAID has two major energy initiatives covered under its strategic objective agreement with the Government of Indonesia. They are (1) short term technical assistance to DGEED in support of electricity regulatory reform and (2) technical assistance through a Participating Agency Services Agreement (PASA) with the U.S. Department of Energy's (DOE) Albany (Oregon) Research Center in support of supply side efficiency. At this time, only the PASA is active and will be described below. Short term assistance to DGEED has been temporarily suspended awaiting the outcome of this strategy and the elections.

Support Through the PASA

Background: The goal of USAID/Indonesia's Coordinated Local Environmental Action Network (CLEAN)-Energy program is to reduce greenhouse gases (CO₂ and CH₄) and local pollutants (NO_x, SO_x and particulate matter). In August 1996, USAID/Indonesia entered into a PASA with the DOE's Albany (Oregon) Research Center to help achieve that goal through a supply side efficiency improvement program. The agreement was first funded under the Asia Sustainable Energy Initiative, then renewed in August 1998 (through September 2001) with funding under CLEAN-Energy. As a result of the supply side program, there has been a large pay-off to the Indonesian people, the Government of Indonesia and to USAID/Indonesia in terms of measurable impacts for the modest investment.

The only way to reduce greenhouse gases in fossil energy power plants is to use less fuel per unit of electrical energy generated. To do this, most power plants throughout the world attempt to increase thermal efficiency (i.e., decrease heat-rate) which achieves four positive results: 1) reduced emissions of greenhouse gases and associated pollutants; 2) reduced mass of fossil fuel burned; 3) reduced waste by-products such as fly ash (i.e., particulate matter); and 4) reduced total cost of fuel per unit of energy service delivered. In addition to those benefits, USAID's Supply Side Efficiency Improvement Program is increasing potential investor confidence in Perusahaan Listrik Negara (PLN), Indonesia's national utility.

U.S. Partners: USAID/Indonesia and ARC have partnered with and/or continue to partner with a number of US institutions to help implement the terms of this PASA. These organizations include: the Tennessee Valley Authority (TVA), the University of North Dakota's Energy and Environment Research Center (EERC), DOE's National Renewable Energy Laboratory (NREL) in Colorado and Washington, D.C., DOE's Federal Energy Technology Center in Pennsylvania, the U.S. Asia Environmental Partnership (USAEP) Program based in Washington, D.C. and the Institute for International Education (IIE) based in Washington, D.C.

Achieved Impacts: PASA activities produced four substantial impacts during the first two years: 1) estimated annual reductions of 106,484 metric tons of CO₂-equivalent (i.e., greenhouse gases and associated local pollutants) from the Paiton power station; 2) estimated 1.5 percent increased thermal efficiency at Paiton; 3) a proven sustainable transfer of knowledge to Laboratorium Sumberdaya Energi (BPPT-LSDE) and to PLN's Paiton power station regarding causes of and solutions to coal slagging and fouling problems (which cause unscheduled shutdowns); and 4) increased potential revenue for Paiton as the power plant can now remain on-line for longer periods. For each day that a power plant such as the Paiton must remain off-line, the utility loses hundreds of thousands of dollars of potential revenue.

Current and Planned Activities: Under the current PASA, PLN is now eager to collaborate with USAID/Indonesia and USDOE/ARC to improve the plant thermal efficiency at its power stations. Paiton will be the first plant to receive technical support to demonstrate the potential financial and environmental benefits of improving plant thermal efficiency. Increased thermal efficiency reduces emissions of greenhouse gases and associated pollutants, reduces the amount of fossil fuel that needs to be burned, and increases potential investor confidence in PLN. The activities under the PASA will again focus on both technical changes and (human) process changes both at the Pembangkitan Jawa Bali II (PLN Java-Bali II Generation Company - PJB2) office in Surabaya and in its power stations.

Future Potential Impacts: The plan for future activities includes the expansion of the efficiency improvement program from Paiton to the other PLN power stations. Knowledge and performance transfer to all PLN plants will impact over 6,000 MW of electricity generation capacity. A gain in efficiency, such as moving from 33 percent to 34.5 percent, will reduce annual emissions of CO₂ alone by approximately 1.2 million metric tons.

USAID'S COMPARATIVE ADVANTAGE⁷

The major barriers facing Indonesia in energy on the road to sustainable development are all in areas where USAID and U.S. industry have a comparative advantage over other bilateral donors and multilateral development banks. While MDBs and other bilateral donors can and do address the physical infrastructure, they do little to address the major policy, regulatory and institutional building barriers.

USAID has the ability to apply the valuable experiences gained in working in other developing countries and energy economies in crisis to assist Indonesia in making the move to market-led economic structures. Specifically, in the energy sector, USAID can call upon its reference and resources base to develop programs of technical assistance to overcome and remove barriers and constraints currently existing in the region. In this respect, USAID already has well-designed and tested mechanisms for assistance in:

- Analysis of energy sector reform options; (eg. Pakistan, Central America, and Eastern Europe)
- Provision of resident technical advisors to strengthen institutional and human capacity; (eg. Indonesia, India, and Brazil)
- Elaborating and drafting coherent and consistent policy and legal frameworks for private power development; (eg. Philippines, Egypt, and Central America)
- Supporting financial and investment reforms for attracting private capital; (eg. India, Philippines, and Eastern Europe.)
- Establishing training and utility partnerships for exchange of information, best practices, and operational techniques; (e.g. New Independent States, Eastern Europe, Philippines, and Indonesia)
- Cooperation in clean energy technologies and transfer of energy efficiency techniques; (India, Brazil, and Mexico.)
- Facilitating regional integration of energy and electricity markets; (Central America, Southern Africa, and Eastern Europe.) and
- Brokering commercial interactions between the U.S. and foreign private sector firms.

USAID brings expertise and institutional memory to address these issues. USAID's experience has shown that successful exploitation and development of a country's energy resources requires joint private-public sector approach with the private sector tackling commercial issues while the donor community works with national governments to remove institutional, legal, policy and fiscal barriers. (Eastern Europe, Central America, Philippines, and India)

USAID has experience from Asia, South America, Eastern Europe, and the New Independent States (NIS) in virtually every facet of energy sector promotion.

⁷ This section was drawn almost entirely from another USAID report by Carl Duisberg, Robert Blumberg and Matthew Addison. This is done because USAID has many of the same comparative advantages regardless of where its assistance is provided. While the Indonesian challenges have a distinctively unique flavor, they are still, in many ways, the same as those faced by countries the world over and Indonesia will benefit from their experiences.

USAID is well placed to fill the critical regional niche: in addition to the diverse experience of the U.S. in addressing such issues, USAID has flexibility in applying grant funds to provide well-targeted technical assistance and training on a regional basis outside of bilateral agreements.

USAID'S ENERGY STRATEGY FOR INDONESIA

The energy strategy supports two goals each with two objectives: (1) Policy and Economic Reform with the objectives of Crisis Mitigation/Social Safety Net (Reduce economic hardship/dislocation associated with economic crisis), and Economic Recovery (Increase private sector participation, capital inflows and increase efficiency in production and consumption of energy); and (2) Environmental Protection with the objectives of reducing GHGs and local pollutants.

The objective of USAID's energy strategy for Indonesia can be summarized as:

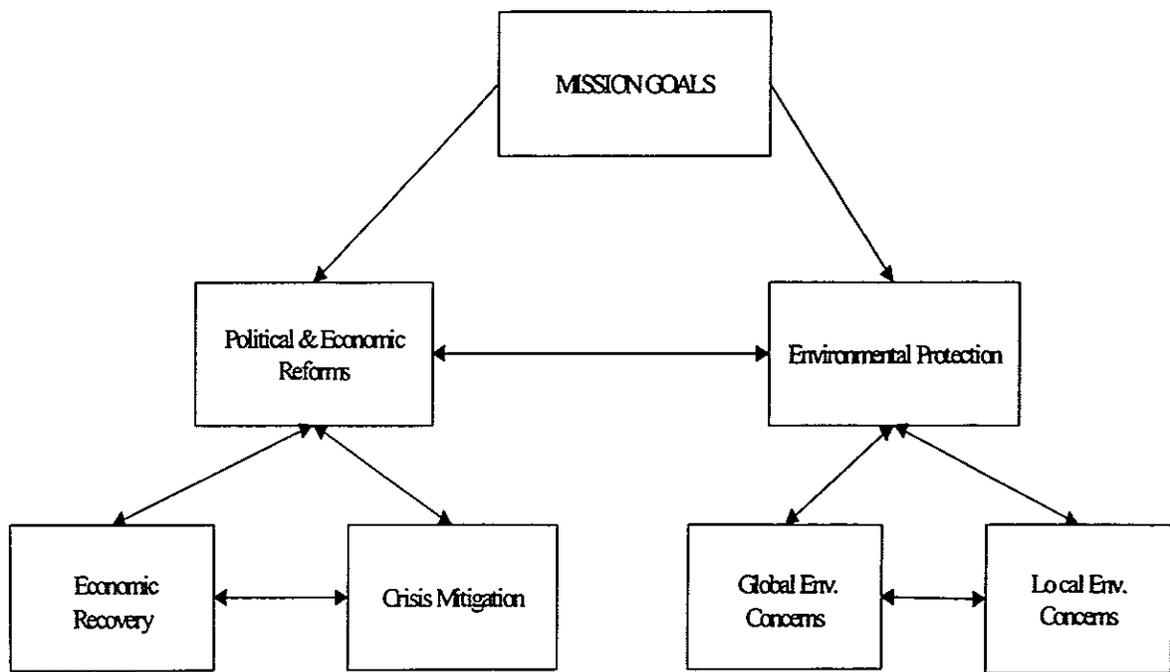
- Support survival of Indonesia's energy sector, and therefore the economy as a whole, during this crisis period, *while*
 - taking advantage of the window of opportunity the crisis presents to implement reforms unthinkable only a few months ago *in order to*
 - pave the way for the emergence of a sound and robust post-crisis energy sector that is a driver for sustainable economic growth and development.

Figure 1 graphically portrays the Mission's strategy. The Mission has two goals for energy activities, policy and economic reform and environmental protection and these have, respectively, the objectives of crisis mitigation and economic recovery and global environmental concerns and local environmental concerns. The traditional view of development has been to view these goals as separate, relatively unconnected areas. Economic growth and development could be pursued without explicit regard for the distribution of income. There were no apparent links between poverty and environmental degradation. Additionally, the feedback of environment/resource quality on long term economic growth was not considered.

It is clear from this figure that these goals are highly interlinked. In fact, it is not reasonable to separate out many of those factors that make for economic recovery from those that reduce pollution. For example, one of the most important steps that Indonesian policy can now take in environmental protection is to allow energy prices to accurately reflect opportunity costs⁸. This will drive producers and consumers to efficiently use the resource. In the Indonesian context this would mean producing less energy to serve a given need and, therefore, less pollution. This is also one of the most important steps in economic recovery. Ultimately if private capital is to flow into the sector, then that capital must earn a reasonable rate of return. It will only do so if prices are rationalized. Another example includes when the Mission promoted supply efficiency at power plants. There were significant economic and environmental benefits.

⁸ This refers to average prices. It is recognized that there are tradeoffs between efficiency and income distribution and that society chooses to provide its poorest members with some minimum level of energy consumption.

Figure 1



COMMON FEATURES OF ALL MISSION GOALS

- Price rationalization
- Industry Restructuring to allow Private Provision and Competition
- Efficiency in the production and consumption of energy
- Independent Regulatory Body to protect consumer interest, promote efficiency and correct for market failures.

In the context of the Mission's energy strategy *crisis mitigation* refers to social safety net issues of price and non-price measures designed to provide a minimum level of energy consumption at a reasonable cost. Or, measures designed to alleviate the financial burden faced by the country's energy producers. *Economic recovery* means an increase in economic activity in line with or not far from the long run sustainable growth path. This distinction in economic recovery is important because it says that not every short-term recovery strategy is in keeping with the long term best interests of the country. Sustainable economic recovery requires that industry have access to a reliable supply of energy at the lowest possible cost consistent with sound economic pricing. This is not a matter of whether energy prices should be equal to the resource's long run opportunity but rather the path they take in reaching those prices. A short run recovery fueled on unsustainable resource consumption activities or by sacrificing the financial viability of energy industries will be short lived, contribute to a reduction in the long term potential of Indonesia and eventually lead to another crisis situation.

Underpinning the design of CE activities was the understanding that there is no conflict between long run sustainable economic growth and appropriate concern for the environment. In fact, it is the premise of such fundamental declarations as the Brundtland Commission, that concern for the environment goes hand-in-hand with long run sustainable development. However, it is now an acknowledged fact that concentration on short run economic growth without adequate regard for the environment can keep economies from reaching their long run sustainable potential.

To what extent do tradeoffs exist between the short run goals of crisis mitigation and economic recovery and the long run environmental goals? Can both be met simultaneously? If not, what guidance can be given to the Mission in choosing between these options?

At the heart of the question is the determination of how the Mission wants to support the short run goals. These goals are not mutually exclusive. If the Mission decides to pursue no activity [clarify or re-phrase as follows, "to only pursue activities that support both long and short run goals"] which does not support both short and long term goals, there is substantial ground to cover. In fact, there should be no conflicts between the goals of economic recovery and long run environmental protection as they have been defined here. Protecting the environment is one of the major factors in ensuring that economic recovery is not short lived. The two most important activities which will address all goals are (1) the restructuring and regulatory reform to develop enabling frameworks for private sector involvement and (2) judicious price rationalization.

There are *apparent conflicts* between both short run goals and the long run goal that revolve around pricing. Some energy prices will now be determined by market forces. Others will be regulated. End use energy prices do not now reflect their opportunity costs and this has important implications. First, energy producers such as the electric utility face a financial squeeze, caught between increasing input prices and stagnant retail prices. This impairs their ability to maintain assets, meet their financial obligations and supply energy. Secondly, lower energy prices mean more energy consumed and this increases environmental degradation while sacrificing energy assets.

Assistance must address two issues:

- In the short run it must address the issue of the energy companies' financial viability.
- In the long run it must address the issue of the raising prices.

The question is not one of whether prices, on average, should rise and be equal to the opportunity cost of using the resource. It is acknowledged that some life-line rate or quantity is required for the poorer members of society. How to accomplish this and the precise mechanism are things that USAID proposes to assist the GOI in determining. The important and unanswered question is how quickly should the majority of energy prices be raised. Indonesia has recently witnessed the political and economic turmoil that can be caused when energy prices rise too quickly. There are a number of reasons favoring a gradual rationalization of prices and these reasons equally support all the Mission's energy goals, principal among which are:

1. Indonesia's industrial and commercial infrastructure has been built on energy intensive capital.

Given the current economic environment, Indonesian industry would be unable to raise product prices to reflect an increase in energy costs. In the short run industry's response to rising energy prices will be rather inelastic if the industry remains viable and active. Substitution, as much as is possible, is usually to dirtier fuel such as from low sulfur distillate to higher sulfur distillates, from gas to oil, or from diesel to diesel and kerosene mixed. On the other hand, energy consumption can fall drastically as business succumbs to higher costs and reduces output and employment. Rapid energy price shocks have both sectoral and macro economic implications that suggest a gradual rise in prices will bring fewer economic and social losses. As the economy enters recession, poverty brings about an increased use of renewable resources in a unsustainable manner, e.g., pressure to export more oil, gas, coal and timber than would otherwise be exported and forests cut in an unsustainable manner. Thus, allowing prices to gradually increase is critical in reaching all these goals.

2. Consumer reaction is also limited because of the opportunities open to them to substitute away from energy or to lower cost, clean energy. Protecting the environment and protecting consumers require some form of support.

In general, consumers continue to consume a basic quantum of energy for necessities such as cooking, lighting and cooling and have fewer funds for remaining expense items such as education and health. In some cases, they transition to lower cost fuels such as kerosene. In other cases, when biomass alternatives are available, they become a substitute in some energy applications and increased, unsustainable harvesting of biomass resources takes place. In other words, some people will begin to increasingly cut trees for fuel. In either instance there is a significant increase in indoor air pollution and a consonant rise in morbidity and mortality – both a short run drain on the country's medical resources and a long run drain on the country's human resource potential. Again, achieving the Mission's goals means that low income consumers must be protected by some form of life-line rate or similar mechanism designed to provide a minimal level of energy at an acceptable cost.

As a result of changing circumstance and priorities, are there important interventions that were not options when CLEAN-Energy was designed?

The economy and political system of Indonesia have been undergoing significant change in ways that could not be predicted when CLEAN-Energy was developed. There are now three major areas of intervention which either were not avenues of exploration when CE was designed, or were not promising. They are:

1. Restructuring of the oil and gas sector:

Restructuring of the electricity sector was entered into only under duress from the donor community. Since the oil and gas sector was still profitable and the economy had not fallen to its lowest point, it was not considered for restructuring. However, the need for capital and the IMF conditionalities have now made restructuring of this sector a priority. This opens up significant opportunities to transform the energy sector.

2. Price rationalization:

Additionally, the GOI had been unwilling to entertain significant increases in energy prices in large part because it saw this as a means of placating public opinion. In light of the economic conditions, some energy prices must significantly rise although some will fall for a small number of users. On average this will (1) significantly raise the incentive for conservation and efficiency activities and (2) significantly increase the relative cost of energy. **However, pricing is a complicated issue. If they are raised too fast then the economy will not recover. If they are raised too slowly then the long run sustainability of the economy will be jeopardized.** In the mean time, some form of relief is required for energy companies so they can continue to supply sufficient energy and are relatively attractive targets for privatization.

Guiding Principles

The CLEAN-Energy guiding principles for choosing activities have only been reinforced by the events of the last eighteen months and they still form the guidance for developing the Mission's strategy with minor modifications. To this strategy is added one more principle and they now are:

1. ***Only take actions that support both long run and short run goals.*** As discussed briefly above, this is easily done provided that decision makers link energy, the environment and the economy and provided they strive for sustainable growth and development. This will be further demonstrated in the report and forms the paramount basis for choosing activities.
2. ***Build a foundation for sustainability and replicability.*** It is important that Indonesia restructure and reform in such a manner as to promote long run sustainable growth. Economic recovery will not be on the horizon if energy is not abundant and low cost (in the economic sense). Economic recovery will not be sustained if prices do not reflect the true sacrifices being made by Indonesia, including the environmental impacts, in the production and consumption of energy. Given the limited resources available, both in the donor community and the Indonesian economy, activities should lend themselves to being replicated so that the impact on the economy is the greatest.

3. ***Build upon other donors' programs.*** The Mission's strategy is designed to leverage other donors' investments by seeking that critical, pivotal area missing from their assistance packages. USAID's funding is very limited and by itself is unlikely to cause major changes. Most assistance, despite its size, is rarely designed to meet all the needs of an activity or program. Sometimes this is by design while other times it is because project design has missed some critical step. Experience with CLEAN-Energy has validated that by piggy backing on other donors' efforts, USAID can play a pivotal role. Thus, its marginal investment is that activity which will make the undertaking a success.
4. ***Build on current trends. Don't swim upstream.*** This principle allowed CLEAN-Energy to make significant inroads in the restructuring and regulatory reform of the electricity sector activities. Now that necessity has opened up other areas, USAID assistance should focus on those key areas and support the momentum of current policy, legal, bureaucratic and economic movements. In other words, new and existing activities seek to work with the change which is taking place and to reinforce rather than to initiate change.
5. ***Build on other (CLEAN-Energy) activities to reinforce the entire program.*** New activities should be designed to build upon and reinforce each other and the existing activities. With a limited amount of funds, leveraging is important but so is a design that tries to make each activity support and reinforce the other activities. This will happen when the lessons learned in the electricity sector activities are passed along to the oil and gas sector restructuring and regulation reform.
6. ***Build on activities that make good economic and financial sense now.*** This advice for CLEAN-Energy activities was given so that there would be "no regrets" activities. That is, that there should be activities that would be undertaken even if there were no GHG reductions or benefits. This means that in the current environment, these activities are still valid to pursue. They have strong economic and financial benefits. "For Indonesia, no-regrets options focus on improving efficiency throughout the energy sector: production, delivery, and usage. Improved efficiency in both supply and demand sides reduces the amount of generation required to meet the same demand for services. Reduced generation reduces environmental impact and emission of GHG." These activities make even more sense in the current environment but the advice now goes further. New activities, even in the form of advice on subsidies, recognizes their existence and looks to finding ways of reducing their burden. It also recognizes that in the short run such subsidies may be a necessity in order to (a) ensure the financial viability and operation of energy providers, (b) reduce the macro-economic disruption of rising energy prices on the economy, and (c) protect the environment from irreparable damage.

The USAID strategy will maximize the limited resources available by supporting a synergistic blend of energy activities targeting economic recovery, financial stability for State-Owned Enterprises (SOEs), development of a social safety net, and reductions in greenhouse gas emissions. These resources include a new full-time Energy Advisor PSC, a part-time Energy Advisor PSC, an FSN Energy Officer plus resources made available through the CLEAN-Energy bilateral program, which include a long-term Regulatory/Restructuring advisor and the use of remaining CLEAN-Energy funds to support an array of short-term TA.

Critical Road Blocks on the Path to Sustainable Development

This section sets out the critical or principal road blocks that USAID assistance is designed to overcome. The Mission has correctly determined that the foremost roadblock to economic recovery and crisis mitigation is that of policy and economic reform. It is also the basis for the long run goals. *While this may be a new realization for the Mission, it was one of the assumptions of the original CE strategy.* Reductions in GHGs and the accompanying local pollutant benefits require that energy producers and consumers operate in the most efficient manner possible and this in turn would require major changes in ownership, operation, industry organization and incentives. Economic reforms that rationalize prices and the development of enabling rules and regulations are the two most important first steps.

The goals require first and foremost efficiency in the consumption and production of energy. Furthermore, there are other requirements that are needed to bring this about. For example, the sector must earn a rate of return sufficient to insure new capital flows when demand exceeds supply – something it is not now doing. Regulation must see to it that monopolies have the incentive to make the optimal investments, e.g., tariffs should be structured to insure that company's view investing in reducing energy consumption with at least the same interest as they do in supplying an additional unit of energy. Companies must be free to operate and make investments to maximize profits. There have been many road blocks that have prevented the Indonesian energy sector from achieving efficiency.

First, prices do not reflect long run marginal costs. Prices have been consistently set at levels below those required for efficiency with five important results:

- The economy has purchased more energy intensive equipment and appliances;
- The economy used more energy than they would in the presence of rational prices;
- While lower energy prices may have given Indonesian industry a competitive advantage in the past, they are now at a significant economic disadvantage vis-à-vis industry that has faced higher energy prices in the past;
- More of Indonesia's mineral assets have been transformed in to lower value uses with the result that long run wealth will be lower and,
- More energy use has meant more GHGs and local pollutants, such as suspended particulates, sulfur dioxide and nitrous oxides, than with optimal prices.

Second, attempts to rationalize prices have been ill-concieved.

The extent of subsidization and its impacts are pervasive. Many petroleum products such as kerosene and diesel are priced far below their economic prices. Others such as LPG are just the opposite. In addition to the fuel price subsidy, transportation on diesel was subsidized so that uniform pricing throughout Indonesia's 15,000 islands resulted. Electric utility margins are being significantly squeezed as new, more expensive private power plants are added to the system while subsidized prices are kept at levels too low to recover even operating costs. This situation has become exacerbated as fuel costs are now driven by world prices. Utilities must pay for ever increasing fuel and capital costs with a rupiah that is drastically lower in value.

In attempting to react to the fiscal crisis and the concerns of the international donor community, the GOI raised energy end use prices dramatically in early 1998. While this did not bring about the recession, it added significantly to political instability.

As noted earlier in the report, prices must be raised to the resource's long run opportunity costs. However, the delicate work here is (1) which end-users should be subsidized and to what extent (2) how quickly should other prices be rationalized, and (3) how best can limited relief be given to energy providers.

Third, much of the energy sector is government owned and operated. It is now an almost universally accepted principal that government provision generally results in inefficient behavior. This inefficiency stems from the fact that government owned and operated entities are usually not driven by profit maximization – the engine of economic efficiency. Managers often do not have authority to marshal resources to achieve profit maximization. Government entities are usually charged with social objectives such as full employment and subsidization. Even when government managers have the authority, their accounting and information systems do not provide sufficient information for making profit maximizing decisions. Additionally, government entities are not subject to the same scrutiny as privately owned enterprises, are used as a means of dispensing political favors and shifting economic rents from public coffers to government officials purses and are often operated as personal fiefdoms.

- All these of these factors tend to make the costs of government provision higher than they would be with private provision and more resources are used than are required to deliver a given level of service.
- Because the entities usually operate at a deficit, insufficient resources are committed to the sector to equate supply and demand.
- GHG and local pollutants are higher than they otherwise would be because more resources, resources which generate GHGs, are used to produce any given level of outputs.

Fourth, there is little competition in the Indonesian energy sector. Even when government provision is not in question, competition is desirable to bring about efficiency. The production, transmission and distribution of oil, gas, geothermal and electricity are controlled by State Owned Enterprise (SOE) monopolies such as Perusahaan Gas Negara (PGN) – the national gas distributor, Perusahaan Listrik Negara (PLN) – the national electric utility, and Pertamina - the national gas/oil producer. Monopolies give rise to inefficiency or what is called X-inefficiency. Some of these areas lend themselves to competition while others are natural monopolies requiring regulation. Achieving greater efficiencies in the Indonesian energy sector, assuming private provision will require:

- Regulation of monopolies to prevent monopolistic abuse and at the same time to reduce the possibility of inefficiency resulting from lack of competition.
- Restructuring to identify competitive sectors and then to break up and privatize those SOE's.

Fifth, the ground rules have not been established for industry participants or they are not transparent. When the state runs most areas of commerce, there are often no clear written “rules of the game”. Each entity operates with relative impunity in its sphere of influence and rules of

the game are only written when one or more government entities have overlapping areas of interest. Private investors, on the other hand, have a definite need for written, codified rules of engagement. They need to know about such things as market entry and exit conditions, competition from government entities, the size and scope of their markets, and regulation of price and/or competition. Foreign investors need reassurance that critical matters such as rate increases will be dealt with in an impartial and professional manner rather than being placed in the hands of the relevant government minister.

This lack of established rules and regulations or their transparency has led to the non-optimal investment in the energy sector. For example, because the rules are not readily transparent, the costs and risks of establishing a power plant are greater than they would be otherwise. This has led to some of the most expensive new power in Asia. Moreover, because the bureaucracy has not been adequately bound by rules, important investment opportunities have not been made. For example, rather than investing in important transmission and distribution assets, the majority of investment has been in new power plants.

Sixth, market imperfections prevent adoption of energy efficiency on both the supply and demand side. There are issues of information gaps, first cost problems and financial and managerial constraints.

- While the “economics” justifies the use of energy saving appliances, consumer purchases are bound by what is called the first cost problem. They simply can’t afford to purchase energy efficient appliances even if the life cycle cost is less;
- Faced with the choice of using limited resources, managers will generally choose protecting market share rather than reducing energy consumption;
- Managers often are not aware of the technical/financial rewards of investing in energy efficiency; and,
- In a recession of the magnitude in Indonesia, consumers typically consume capital assets rather than maintain them. This leads to less efficient use of energy (e.g., oil is not changed as frequently as it should be, friction and heat increase and more fuel is consumed and/or pollutants are emitted) and in some cases it leads consumers to switch from a cleaner fuel to a dirtier fuel.

The Mission’s energy activities were chosen to address these road blocks within the guiding principles set forth above. Individually the activities, in some cases, address most of these road blocks but in a few cases they address only one. While the links to improved economic recovery and crisis mitigation are very apparent, the link to the Mission’s environmental goals may not seem so apparent. The Mission’s environmental goals are principally met by: (1) increased efficiency – more energy output for less energy input or more services for the same level of energy – and this is driven by prices, technical measures and standards; (2) fuel switching – moving to cleaner fuels – driven by relative fuel prices, technology and standards; and, (3) reduced demand from increased prices.

The Mission has been working very closely with the MDBs and donors active in electricity restructuring policy formulation, the World Bank, ADB and OECF. This cooperation will continue during the policy implementation phase. Although the World Bank and ADB are not

likely to provide any new loans in the energy sector in the near future. the ADB is scheduling a \$400 million loan for the GOI for a social safety net. This loan contains a number of covenants, especially that the disbursement will be tied to the progress in the implementation of the electric sector restructuring. In the near future, absent the assistance from the MDBs, the energy sector will largely depend on (i) its ability to generate income and (ii) direct subsidies from the GOI.

The strategy of the Energy Office to address these issues is to create the enabling environment for a more efficient energy sector and greater investment in use of cleaner fuels for direct consumption and electricity production and more efficient production, and consumption of energy.

This enabling environment will be created first through reform of the energy sector, second through funding development of an implementation plan focused on improving air quality (including energy efficiency, renewable energy and clean fuels) and third, strengthening NGO's to promote policy reform and private investment in renewable energy and energy efficiency.

Energy sector reform activities will address 1) improving the efficiency of the sector, 2) rationalizing pricing of energy, 3) attracting private investment and 4) laying the foundation for additional policy changes which support renewable energy and energy efficiency. In addition, USAID will assist the GOI in providing a social safety net through targeted subsidies while rational pricing is being implemented. Efforts include providing advisors, financing studies, and providing assistance to PLN and PGN in dealing with restructuring through training and the utility partnership program.

USAID will also implement projects that have a direct impact on promoting investment in renewable energy and energy efficiency. Efforts include support of the DOE's efforts to build a sustainable heat rate improvement program for the PJB generation companies (PLN subsidiaries), developing an implementation plan for Jakarta Air Quality Improvement and implementation of the projects included in that plan, including an Unleaded Gasoline Program and supporting a Renewable Energy Association.

USAID assistance will also lay the foundation to support longer term efforts to promote energy efficiency and renewable energy projects through the judicious use of NGOs.

Activities

The Mission strategy is to focus on a number of specific areas consistent with the Mission's Special Objective (SpO) -- Strengthened Environmental Management and which jointly support the Mission's short run goals. The Mission is in the process of developing its strategy and has identified a number of key areas where immediate support is required by the GOI. These are presented, in order of priority, below. Priorities were developed by considering the following:

Whether the activity support both goals, whether the activity frees up or leverages immediate donor funding (such as the ADB \$400 million Social Safety Net loan), whether an activity supports or builds upon a past or ongoing activity, and the impact on other markets or sectors.

1. Energy Sector Policy/Restructuring and Capacity Building
1. Electricity Sector Reform
1. Oil and Gas Sector Restructuring
1. Energy Sector Subsidies Targeting and Price Reform
1. Supply Side Efficiency
2. Demand Side Efficiency
- 2 Renewable Energy Policy Support
2. Air Quality Improvement Program
3. U.S. Utility Partnership Program

The interventions are divided into two broad areas: (1) Energy Sector Restructuring and Regulatory Reform; and, (2) Urban and Environmental Management. Indicators are discussed for each of these areas.

Energy Sector Restructuring and Regulatory Reform

- **Energy Sector Policy/Restructuring and Capacity Building**

USAID/Indonesia has an on-going sector policy and restructuring program in Indonesia including a number of long-term and short-term energy advisors. The economic crisis has surfaced the need for reorienting the priorities of this program to focus on the most urgent sector restructuring needs that have the biggest pay-off to keep their economy afloat.

There is a need for discussion to be held with the various energy advisors under the program in order to develop a slate of highest priority sector restructuring interventions consistent with USAID/Indonesia objectives and the immediate requirements of the Government of Indonesia. As part of this assessment, specific scopes of work and budgets for immediate-term sector restructuring requirements should be developed. In developing these recommendations, full consideration should be given to the those covenants and the requirements imposed by the World Bank and the ADB on the Government of Indonesia, which are currently acting as impediments to the government's ability to create a social safety net and avert a more serious economic disaster.

In effect, this activity will address the broader energy sector issues rather than those confined to one subsector such as electricity or oil and gas. General guidelines should exist with respect to issues including, but not limited to, efficiency, the use and promotion of renewable energy and cogeneration, consideration for environmental impacts of energy activities, and general pricing guidelines. This is more efficiently handled at the Ministerial level with its overarching responsibilities.

- **Electricity Sector Reform.**

Under CE, USAID Indonesia began to make inroads into regulatory reform. The Mission will continue to assist the GOI to implement electricity sector reform policies. This will include a continued focus on developing the required "foundation" regulatory mechanisms critical to restructuring, such as a planning code, procurement code, tariff rules, distribution code, etc. Restructuring the electricity sector has begun to provide the GOI with some of the tools

necessary to move toward privatization and to increase renewable energy development. USAID can access the necessary expertise through a variety of vehicles such as the IQCs recently implemented by G/ENV/EET, institutional contracts or a PASA.

The success of many aspects of the reform process hinge on a successful restructuring of the IPP program and its legacy of PPAs previously negotiated in a non-transparent environment. USAID has already provided assistance to GOI/PLN to develop a restructuring strategy to the IPP program. This assistance has successfully attracted subsequent WB and ADB involvement and additional USAID assistance focused on the IPP/PPA restructuring effort is not foreseen. Major issues such as stranded costs need to be determined, not by a bureaucracy or national utility, but by the regulatory body.

It is only through well targeted technical assistance that these utilities can (i) reduce the gap between production costs and energy prices, (ii) reduce the need for direct government subsidy, (iii) become more eligible for foreign investment, and (iv) put themselves on a path of recovery and profitability.

- **Oil & Gas Sector Restructuring.**

USAID will assist the GOI, in cooperation with the World Bank, in formulating the policy and implementation plan to restructure the “downstream” portion of the Oil and Gas Sector (refinery, transmission, distribution), including an emphasis on introducing competition, privatization, improving sector efficiency and improving transparency. Restructuring and regulatory reform of the Oil and Gas sector is of critical importance both as a stand alone activity but more importantly because of its relationship with the power sector and the important issues that are being dealt with there. For example, if electricity prices are rationalized without a subsequent rationalization of petroleum prices, there will be increased investment in captive power.

The introduction of competition will increase efficiency, provide needed capital inflows and make a positive contribution in a number of areas including much needed foreign exchange. The economic crisis has significantly reduced the manufacturing sector’s output and exports as many factories and plants have reduced production or shut down due to a lack of investment funds and inability to acquire critical foreign material and equipment which must be purchased in hard currency. Therefore, there is strong need to assess options that would enhance oil sector exports and deliver critically needed foreign exchange into the Indonesian economy.

- **Expand the Utility Partnership Program.**

USAID/Indonesia will expand certain aspects of the Utility Partnership Program initiated under the now largely completed Asia Sustainable Energy Initiative. The current program, managed by the U.S. Energy Association through a Cooperative Agreement with USAID, funds a series of executive level exchanges between PLN and a U.S. utility, Portland General Electric, which provides exposure to approaches that address areas of mutual interest. USAID/Indonesia should continue the program as the system restructures and couple this with directed technical assistance in areas that support and reinforce the partnerships.

These partnerships bring executives together face-to-face and this interaction can address issues in ways that no consultant can. Moreover, they provide Indonesian executives with hands-on experience in U.S. utilities. Experience in other USAID partnership programs has shown this to be a very important tool, if properly managed by the Mission⁹, in addressing senior executives concerns and in changing their mind set. Partnerships in other countries have sometimes resulted in US utilities taking equity positions in host utilities.

- **Energy Sector Subsidies Targeting and Price Reform.**

Develop a subsidy strategy and implementation plan that will most effectively target GOI's extremely limited resources to keep the energy sector afloat. Avoiding a sector meltdown and the accompanying turmoil will, in itself, provide a form of social safety net for the general population in the bigger picture, while at the same time help to protect lower income groups. The World Bank has expressed interest in working with USAID/Indonesia to develop this social safety net for the general population. And, as noted above, the restructuring component of the USAID energy strategy will directly leverage the \$400 million ADB social safety net loan, which hinges on progress in power sector reform.

Indicators

As this is essentially the expansion of the ongoing USAID assistance activities, the team believes that the existing policy index is still the relevant indicator set. Baselines cannot be established at this point until agreement with the GOI is reached on the proposed expansion of activities.

Urban Environmental Management Development

- **Supply Side Efficiency Improvement.**

USAID has demonstrated the overwhelming financial, economic and environmental benefits of working with PLN to improve generating efficiencies of PLN power plants while using relatively limited resources. When CE was first begun, it was anticipated that technologies introduced in one plant would serve as a demonstration ground and training arena for propagation of those technologies to other plants – meeting one of the criteria of replication. These plants operate 24 hours a day, generating large amounts of greenhouse gases (GHG) in the process. Thus, even small efficiency improvements translate into significant reductions in GHG emissions. At the same time, the improved power plant efficiency reduces the financial strain on the utility and increases the attractiveness of assets to the private sector. The technical activities under this program will emphasize transfer of expertise and improving operating procedures through improving operational monitoring in fossil energy plants and improved operating procedures based on the information from the improved monitoring

⁹ Experience has shown that these partnerships work best when the Mission works proactively with USEA and the Utility to dovetail exchanges with ongoing technical assistance and/or immediate concerns. Care should be taken in choosing the US utility.

Given the financial constraints facing PLN, they are unlikely to engage in this type of activity with their own funds even though it has substantial financial and economic benefits. Yet, this type of activity has immediate financial, environmental and economic gains and every effort should be made to assist these plants through the PASA – making this a high priority activity.

- **Demand Side Efficiency**

Because of market imperfections investments in energy efficiency are suboptimal. Experience has shown time and again that only when prices are correct and some other push exists, does energy efficiency begin to take hold in the economy. This push can be the regulatory mechanism, as described elsewhere in this report, to motivate DSM. It could be a mandatory equipment or appliance standard. USAID has helped to address this issue as part of its ongoing electricity sector restructuring and regulatory reform activity.

USAID/Indonesia has long acknowledged the role and contribution of NGOs to the energy sector. The current economic crisis has created greater opportunities for improving end-use efficiency (“demand-side efficiency”), opportunities that were not previously an option. Experience has shown that NGOs can be very effective in energy efficiency. NGO networks are quite effective in enhancing sustainability and require the coordination of information with other stakeholders, industry associations, and government entities to foster an ever-expanding support and buy-in for program implementations. The use of NGOs in Indonesia has been advocated by most donors as they can be integral partners with donors and the government in public outreach and public advocacy as the GOI goes through the restructuring process.

There is an opportunity now to promote a suitable NGO that can implement a comprehensive end-use energy efficiency program in partnership with a potential U.S. NGO. Technical assistance would develop the NGO’s capacity by providing the resources to conduct an energy efficiency awareness campaign and to seek opportunities to implement activities in energy efficiency.

This is not considered a priority area for a number of reasons. First, an NGO needs to be identified. Second, as mentioned above other measures must first be in place. Any number of avenues are open but awareness and labeling will not prove very successful until these changes come about.

Indicators

The team believes that the current indicators for supply side are still relevant but could be expanded to include other GHGs. The Mission is advised to study this matter through the resources of the PASA. On the demand side, the team believes that a policy index¹⁰ should be adopted and this might include rules and regulations adopted by the regulatory body to promote energy efficiency. Since the NGO activity is not considered a priority in the current environment, indicators are not proposed.

- **Air Quality Improvement Program**

¹⁰ In actuality this index includes policies, rules and regulations.

The primary objective of this activity is the reduction of air pollution impacts in Jakarta through an air quality improvement program. Air quality management initiatives will be identified and action plans developed in conjunction with GOI counterparts. In addition, the program will be developed within a community participatory framework that stresses comprehensive stakeholder participation and transparency in decision making. This broad public participation will be particularly important in implementation of critical social policies, e.g., the elimination of fuel subsidies or the involvement of the community in an independent regulatory body. Initiatives that may be investigated include: vehicle standards, fuel switching, traffic management options, fuel standards and an unleaded gasoline program which is described below.

Introduction of an Unleaded Gasoline Program.

USAID/Indonesia has identified a critical need for assisting the GOI with a comprehensive program to gradually phase-in an unleaded gasoline program in the country. This objective is consistent with the Mission's objective to promote the production and consumption of clean energy. In addition, a program structured to gradually transfer the economy to unleaded gasoline use goes a long way in responding to the sectoral requirements particularly imposed on GOI by the MDBs as part of their lending programs. The \$400 million ADB Social Safety Net Loan conditionalities include clean end-use energy restructuring as one of the sectoral reform activities.

The transport sector in Indonesia is both a major consumer of end-use energy (gasoline and diesel) and is also a major polluter given the current wide spread use of leaded gasoline. A program aimed at the gradual transfer of the transport sector from leaded to unleaded gasoline use will not only result in increased end-use efficiency of petroleum products but may also provide directly quantifiable global climate change benefits vis-à-vis sizable GHG reduction¹¹. In this sense, this program is consistent with the thinking within GOI, the USAID Mission in Jakarta, the USAID Global Bureau in Washington, the bilateral donor community at large, and the MDBs. This program would also put Indonesia in the ranks of key countries for donor focus and possibly assist GOI in leveraging/unlocking MDB funding.

The Mission has concluded that the proposed unleaded gasoline program is a target area for Mission support to the GOI largely based upon the needs of the GOI and donor considerations imposing sectoral reform on the country.

This activity leads directly to the elimination of transportation lead emissions, a substance that significantly impairs the mental processes of children and increases the risk of stroke and heart attack in adult males. By removing lead and its associated "mental" effects, this activity enhances the potential of Indonesia's greatest asset, its people. End-use efficiency is also

¹¹ The net contribution to GHGs depends upon many factors. Vehicle efficiencies increase with the use of unleaded petrol. Catalytic converters reduce both local pollutants and NOx and CO. While these are not greenhouse gases their presence in the atmosphere has a direct impact on GHGs and thus reducing them also reduces GHGs. On the other hand, some catalytic converters result in the transformation of NOx to N2O, a greenhouse gas. Increasing octane will increase energy use and therefore carbon. However, depending upon whether oxygenates or petroleum products are used for octane enhancing, the carbon content of unleaded gasoline will or will not increase. Greater analysis is required using Indonesia specific parameters to determine the net impact.

increased. Empirical evidence indicates that unleaded fueled vehicles require less maintenance and are more efficient than lead fueled vehicles. In the long run, this measure is intended to allow for the introduction of catalytic converters that will significantly reduce automobile emissions of CO and Nox. And while these are not greenhouse gases, they do have indirect effects on atmospheric concentrations of greenhouse gases, including carbon dioxide, methane, and ozone.

Indicators

Two indicators are proposed. The first is a policy indicator tracking the development of policies, rules and regulation on lead phase-out or elimination and for other transportation pollution management issues. The second indicator is the amount of lead per liter of gasoline. Baselines cannot be established at this time but will be done in further consultation with the GOI.

More detail on the activities is presented as an Annex.

ANNEX DETAIL ACTIVITY DESCRIPTIONS

Energy Sector Policy and Strategic Advisory Assistance to the Ministry of Mines and Energy

Background

In consultations with the IMF, the Ministry of Mines and Energy has agreed to implement a comprehensive process for restructuring the electricity and energy sector in Indonesia. In August 1998, the MME issued its Electricity Sector Restructuring Policy. Also, the MME has proposed an Oil and Gas Law, which is in the Parliament, and is expected to be passed soon. The DGEED is also the Executing Agency for the US \$400 million social safety loan along with eight individual TAs. In order to affect the process of restructuring, the MME has established an Electricity Sector Restructuring Secretariat. This Secretariat is currently understaffed and is in need of considerable advisory assistance.

The pace of the reform process has created an enormous demand on the MME and the Minister of MME to announce policies and respond to a wide variety of policy and regulatory activities. The viability of the electricity and energy sectors is crucial to Indonesia's ability to initially mitigate the impacts of the economic crisis and eventually build a stronger Indonesia. The international donor community, in partnership with the Government of Indonesia, has exhibited an outstanding commitment to assisting Indonesia in its economic recovery process by offering assistance to strengthen and reform the energy sector.

The Minister of MME has requested USAID assistance for energy sector advisory services including the appointment of a Senior Energy Advisor within the Ministry to assist both in broad policy areas as well as the day-to-day management of the MME's policy analysis activities.

Terms of Reference

The U.S. Agency for International Development is considering the provision of a Senior Energy Policy Advisor to the Minister of Mines and Energy (MME) to advise the Ministry on a host of policy, regulatory, and reform issues as the Ministry leads the nation in the process of restructuring the energy sector. The specific responsibilities of the Senior Advisor will be as follows:

- Assist the Minister and the Electricity Sector Restructuring Secretariat within the MME on developing policy and position papers, as needed. Some of the key issues may include energy pricing, reform in the electricity sector, regulatory issues pertaining to the proposed Oil and Gas Law, fuel subsidy rationalization, energy supply and demand issues, etc.
- Work closely with other long-term donor-funded advisors to ensure consistency at the policy level. Specifically, work closely with the electricity sector restructuring advisor(s) within the Secretariat and assist the Minister in the restructuring.

- Regularly brief the Minister on the progress of the work conducted by the Regulatory Team within the DGEED, specifically the progress of the restructuring process and any key policy issues that require the Minister's attention or intervention.
- Review the policy and regulatory papers and reports prepared by the various advisors and consultants and offer sound advice to the Minister on policy initiatives.
- Participate with the Minister in various meetings within the Government, the donor community, and the private sector, as requested by the Minister, and advise the Minister on key energy policy issues, as needed.
- Act as a liaison between the MME and energy enterprises (PLN, PERTAMINA, PGN), energy NGOs, industry, and public advocacy groups, as requested by the Minister.
- Assist the Minister in reviewing the progress on the Government's process of capacity building at key operating levels within the MME.

The Senior Energy Policy Advisor, to be selected by USAID, will be an individual with a strategic focus and broad experience in energy policy, regulatory economics, planning and management. The individual should have prior experience in donor coordination, strategic policy formulation, understanding of upstream and downstream energy supply and demand issues, experience in balancing social equity and development objectives, and environmental considerations. Experience in private sector led energy sector development, soliciting stakeholder input, public advocacy role, and consensus building is also required. Extensive experience in Asian energy issues preferably in Indonesia is extremely desirable.

In order to assist the Senior Energy Policy Advisor to advise the Minister effectively on a broad array of energy policy and regulatory issues, USAID also proposes to provide short-term specialist support to the Secretariat in a number of areas. These may include, energy planning, pricing analyses, subsidy calculations and targeting, privatization policies, regulations for unbundling the electricity sectors, economic impact analysis of proposed regulations, petroleum product pricing, etc.

Deliverables

The selected contractor will provide a long-term resident Senior Energy Policy Advisor to work within the MME. Also, the contractor will be responsible for providing short-term experts in a variety of fields, as requested by the Minister of MME and the Senior Energy Policy Advisor.

Counterpart in Indonesia

The Ministry of Mines and Energy in Indonesia will act as the counterpart agency for this technical assistance. The Senior Energy Policy Advisor will be housed within the MME and work closely with Minister and the Electricity Sector Restructuring Secretariat.

Level of Effort

The total level of effort for this technical assistance is estimated to be 24 person months over a 12-month period. Of this, 12 person months will be for the Senior Energy Policy Advisor and 12 person month will be devoted for short-term specialist support.

Proposed Budget

The total proposed budget is \$600,000 from FY 1999 funds. This activity may be refunded for another year out of another \$600,000 from FY 2000 funds.

Electricity Sector Restructuring, Institutional Policy Development, Capacity Building and Training

Background

The Minister of Mines and Energy, in consultation with the IMF, the World Bank, and the Asian Development Bank, has established an Electricity Sector Restructuring Secretariat within the MME. Currently, the Secretariat includes a senior Indonesian official, several expatriate donor-funded advisors, and a few administrative staff. The Minister plans to add up to 14 additional staff members from other departments within the Ministry.

The donor assistance to Indonesia has significantly increased and most of it is targeted on energy sector restructuring. For example, the Secretariat will be responsible for implementing some eight TAs offered as part of the ADB-funded US \$400 million social safety net loan. In addition, the Secretariat will need to coordinate the overall restructuring of the public sector in the power sector, including coordination with the PLN. In discussions with senior officials in the MME, the need for building the institutional capacity of this Secretariat was made very clear. The donor groups, particularly the World Bank and ADB, have also stressed an immediate need for building of the capacity of the Secretariat in order to carry out its new functions in the area of restructuring. Specifically, the Secretariat needs assistance in (i) building its staff capacity; (ii) enhancing the skills of its staff in policy formulation and analysis, and (iii) creating a framework for the development of restructuring plans.

Terms of Reference

The proposed technical assistance will focus on the provision of experts and advisors in order to strengthen the overall institutional policy capacity of the Secretariat within the MME. Currently, the World Bank Technical Assistance is focusing on the restructuring of PLN and establishing competition in the power sector through unbundling PLN to creating multiple players that will operate within the sector. This is a complex process and the MME must ensure a smooth and successful transition from the utility's current integrated structure to a diverse set of electricity generators and distributors. The Asian Development Bank, in partnership with the World Bank, has agreed to focus on the public sector side of the restructuring requirements. As part of the US \$400 million loan, ADB has included eight specific TAs, four of which are concentrated in the area of electricity sector restructuring. The remaining four ADB TA's address key aspects of consumer education and consumer participation in the restructuring process.

In response to a specific request from the MME, USAID intends to provide assistance to the Secretariat in implementing a number of new electricity sector restructuring functions. These include the following:

- Provision of a Senior Institutional Policy and Capacity Building Advisor to be resident in the Electricity Sector Restructuring Secretariat, MME. This advisor will be a long-term expatriate expert with extensive experience in energy sector institutional policy development, training, and human resource development, preferably with similar electricity sectors in other countries.

- Provision of a number of short-term experts with hands-on expertise in key restructuring functions such as the development of competitive electricity market rules, development of programs to analyze bulk electricity market operations, accounting and management information systems, financial tools for assessing the impacts of unbundling markets, single-buyer market design, multiple buyer / multiple seller market design, financial settlement systems, software specification, procurement and implementation, independent market operator (IMO) assessment, demand-forecasting systems, generation scheduling, real-time dispatch systems, energy reconciliation systems, market surveillance systems, developing market codes and mechanisms, coordinating electricity policy with energy policy, conducting trainer of trainers to educate consumers on a competitive electricity market, etc.
- Evaluation of tariff and subsidies with respect to social impacts and public acceptance and the development of strategies to enhance public advocacy in government policy making and market restructuring.
- USAID consultants will work alongside their ADB counterparts to assist sector organizations to implement rules, regulation, guidelines and other assistance provided through the ADB. This assistance includes: Electricity Market Rules (rules for a wholesale market); Electricity Financial Settlements; Software Applications (computer software for the operation of a competitive bulk electricity market); and building public acceptance of electricity tariff increases and strengthening consumer participation in a competitive electricity market.

It is envisioned that short-term technical support will include several on-site training exercises for the staff of the Secretariat in a number of areas, many of which have been mentioned earlier. The primary objective of these targeted on-site training exercises is to shape the Secretariat in implementing its primary functions as the country's power sector undergoes a major electricity sector restructuring.

Deliverables

The selected contractor will provide a long-term resident Senior Electricity Sector Restructuring Advisor with hands-on experience in institutional policy development, capacity building, and training. The primary responsibility of this advisor will be to organize skills development in order to improve the performance of the Secretariat and influence the GOI electricity sector restructuring team to become functional.

In addition, the contractor will provide short-term support, as needed by the Secretariat, in training and capacity building of the Secretariat staff.

Counterpart in Indonesia

The electricity sector restructuring Secretariat within the MME will act as the counterpart executing agency for this technical assistance.

Level of Effort

The total level of effort for this technical assistance is estimated to be 24 person months over a 12-month period. Of this, 12 person months will be for the Senior Electricity Restructuring Advisor and 12 person month will be devoted for short-term specialist support including on-site targeted training and skills improvement in a number of areas, especially electricity market rules, multiple buyer/multiple buyer systems, and financial aspects of electricity sector restructuring.

Proposed Budget

The total proposed budget is \$600,000 from FY 1999 funds. This activity may be refunded for another year out of another \$600,000 from FY 2000 funds.

Technical Assistance for Implementation Regulation for Restructuring the Oil and Gas Sector

Background

The Government of Indonesia (GOI) has submitted a "Law on the Mining of Oil and Natural Gas", commonly referred to as the "Petroleum Law". A copy of this GOI Law is enclosed as Annex IV to this report. It is anticipated that this Law will be passed during the next several weeks. Consequently, there is an urgent priority for the development of the regulations for the implementation of the provisions of the law.

There are several important overriding principles, which form an essential part of developing sound regulations consistent with international best practice. These include the following:

- Regulations should flow from and be grounded in the basic legal authority of the Petroleum Law from which their existence is derived.
- The Petroleum Law should expressly empower the appropriate party (e.g. Minister of Mines and Energy) to promulgate such Regulations and provide detailed procedures to implement the policy and objectives of the Petroleum Law.
- Regulations under a Petroleum Law should be treated as *subsidiary instruments*, not intended for legislative consideration or enactment.
- Regulations should be intended to provide *maximum flexibility*, allowing for rapid response to any future developments in the oil and gas sector which would require timely changes in policy and procedures.
- Regulations should be *comprehensive within defined parameters*. They should cover all necessary details and procedures *to implement the corresponding and applicable enabling provisions of the Law*. They should **not** be intended, however, to regulate the entire sector, outside the limits of the enabling and corresponding provisions of the Law. As subsidiary instruments, the regulations should rise no higher than their source, which is the proposed Law. Matters neither covered nor provided for in the Law should not be the subject of any purported Regulations under the Law. It is *best practice* not to attempt to over regulate but, rather, to leave much specific detail to the natural influences of *market forces* to find their appropriate level.

In the case of implementation regulations for the proposed Indonesian "Law on the Mining of Oil and Natural Gas", the implementation regulations will fall basically into three levels as follows:

- **Exploration and Production of Oil and Natural Gas ("Upstream Regulations")**
- **Transportation and Distribution by Pipeline of Oil, Natural Gas and Petroleum Products ("Pipeline Regulations")**

- **Refining and Product Marketing ("Downstream Regulations")**

The oil sector in Indonesia has undergone a significant level of petroleum exploration and development activity. The Government, Pertamina, and the oil companies have been operating in the upstream area for a number of years and although a comprehensive petroleum law was not existent, the market forces were quite active for providing extensive input on the regulatory aspects of oil and gas exploration and development. The introduction of the new Law offers the opportunity to designing all types of regulations in order to ensure that the oil and gas sector continues to operate successfully and consistent with international best practices.

Although the Ministry of Mines and Energy (MME) and Pertamina have developed detailed procedures for their functions and operations relevant to the oil sector upstream operations, the new Law would require the development of both "Upstream" and "Downstream" regulations. Also, "Pipeline Regulations" will need to be defined in substantial details. The Government of Indonesia has sought USAID assistance for the development of detailed implementation regulations for the new Law consistent with "*best practice*" approaches internationally.

Terms of Reference

The objective of the proposed Technical Assistance (TA) to the Ministry of Mines and Energy in Indonesia is to assist the Government in the development of detailed implementation regulations for the proposed Law on Mining of Oil and natural Gas. The focus of this TA will be the full stream of the oil and gas sector operations including "Upstream Regulations", "Downstream Regulations", and "Pipeline Regulations". In addition, the Asian Development Bank (ADB) will be providing a TA to the MME which will focus on the "Pipeline Regulations". This Technical Assistance will need to be coordinated with the ADB-financed TA.

The selected Consultant, while focusing on the development of all implementation regulations and will offer guidance and advice to the MME, Pertamina, and PGN as required throughout the duration of the TA.

The Consultant will carry out the following specific tasks:

Task 1: Development of Upstream Regulations

As part of this task, the Consultant will develop detailed regulatory procedures for upstream activities including petroleum licensing, contract formats, bid/tender procedures including bid issuance, criteria for bid evaluation, degree of competition, negotiation procedures, award conditions, production sharing agreements (Spas), etc.

In addition, the Consultant will review existing systems and procedures for petroleum upstream operations and develop detailed implementation regulations for the following components:

1. **Competent Authority**

The Consultant will develop detailed descriptions of the missions and responsibilities of the government entities that will be responsible for decisions with respect to oil and

gas exploration and development. Specifically, the Consultant will define individual functions, policy, and regulations. The Consultant will also develop policies and procedures for the coordination and interaction among the various entities involved in 'upstream' activities.

2. Petroleum Licensing

The Consultant will develop detailed procedures and requirements for licensing including public offering and tenders, negotiations, contract areas, and minimum/maximum sizes to be offered.

3. Bid Tenders

This area is one of the most critical aspect of upstream activities. The Consultant will develop implementation regulations for the entire tender process including bid package, maps, geology descriptions, criteria for bid evaluation, model contracts, award and negotiation, PASA/Cooperative Agreement, procedure for publication of tenders, tender rejection criteria, and other related aspects of the bid-award decisions.

4. Petroleum Operations

This area addresses specific requirements imposed upon the Contractor for conducting operations consistent with a PAS/Cooperation Agreement. The Consultant will develop procedures and regulations for (i) submission of Annual Work Program, (ii) approval procedures, (iii) submission of contract area technical data (maps, geology, etc.), (iv) use of best practice, (v) contractor guarantees for complying with regulations and inspections and monitoring, (vi) contractor responsibility to advise authorities regarding proposed wells, and other drilling plans, and (vii) procedures for accounting of oil and gas from a contract area.

5. Flaring of Gas

Typically flaring of all natural gas is prohibited. The Consultant will develop regulations for gas flaring and any exceptions to be granted to the contractors.

6. Petroleum Agreements

In this area, the Consultant will develop procedures for different aspects of petroleum agreements including (i) contract phases, (ii) Minimum Work Obligations (MWOs), (iii) relinquishment of portions of contract areas, (iv) reporting of all discoveries and recommendations, (v) contractors' development plan for commercial level discoveries, and (vi) any retention rights for gas prone areas and gas discoveries for gas development.

7. Fiscal and Financial Regime

the Consultant will develop detailed implementation regulations for both PAS and non-PSA regimes for the exploration and development of oil. Specific fiscal and financial will include (i) rates and contract administration fees, (ii) procedures for bonus payments, (iii) acceptable ranges of production split for profit oil and cost recovery oil, (iv) flat rates, sliding rates, and royalty negotiations, and (v) taxes on profit and revenue.

8. **Accounting, Valuation and Auditing**
this area will include detailed procedures for the contractors to maintain all records consistent with the Law and procedures for audits. Included also will be all financial and accounting reporting requirements.
9. **Assignment of Rights**
Rights under a PASA/Cooperative Agreement may be assigned. The Consultant will developed detailed procedures for the assignment of rights consistent with best international practice and the Indonesian Law. the Consultant will define the requirements/procedures for the timing, type of assignee acceptable, dispute settlement procedures, risks, etc.
10. **Land Access and Usage**
This section will include regulations on the contractors' rights of access to public or private lands that may be necessary for the contractor to perform the contract. This will also include procedures for the compensation to be paid by the contractor for such access.
11. **Environmental Protection and Safety**
The Consultant will develop regulations/procedures pertaining to the environmental and safety requirement to be imposed on the contractors. These may include (i) land impacts, (ii) pollution and waste streams, (iii) emergency cleanup and responsibilities, and (iv) impact on crop, marine life, etc.
12. **Utilization Plans for a Common Structure**
The Consultant will develop procedures for contractors' plan of utilization of common structure to ensure maximum efficiency for recovery of oil and gas.
13. **Preference for Local Goods and Services**
In accordance with the new Law, the Consultant will specify procedures for preference for local goods, labor, and subcontractors.
14. **Records and Reports**
The Consultant will develop regulations for all record keeping requirements of the contractors.
15. **Production Rates and Measurement of Petroleum**
This section will include specific regulations for production rates (mandated rates versus maximum efficient rates (MFAs)) and measuring (meter and weight), and testing.
16. **Confidentiality, Indemnities, and Penalties**
The Consultant will develop detailed regulations for these areas as they are often cause for disputes. the Consultant will use the new Indonesian Law and best international practices as the bases for developing these regulations.

17. Model Forms

In order to ensure consistency, fairness, and efficiency, the GOI should utilize model forms to the extent possible. The Consultant will develop model forms for (i) information on applicants, (ii) contract area application/bid, (iii) schedule of bonuses, (iv) land rentals and leases, and other functions that can be standardized.

Task 2: Coordination with the ADB Consultants on the Pipeline Regulations TA

The Asian Development Bank will be financing a TA focusing on the regulations for transmission and distribution within the context of the new Law. The Consultant will coordinate with the ADB-funded Consultant for this part of the work and document the findings as they may be relevant to the downstream regulations.

Task 3: Develop Detailed Implementation Regulations for Downstream Operations

This task will constitute the bulk of work conducted by the Consultant. The Consultant's experts will develop detailed downstream regulations consistent with the new Law and international best practice. Specifically, the Consultant will focus on the following items:

1. Downstream Regulator

This section will detail the powers, duties and objectives of the member of the Indonesian Petroleum Regulatory Authority with primary responsibility for downstream regulation. It will establish the method of the regulator's appointment, qualifications and skills required, duration of term, etc. The Downstream Regulator, as a member of the Government's Petroleum Regulatory Authority, will be independently funded and provided with adequate budget and staffing for the office. Interim regulation arrangements prior to appointment of the Downstream Regulator shall be established. Also, the Consultant will define a mechanism for an aggrieved party to appeal a decision by the Downstream Regulator.

2. Downstream Regulator's Role

The Consultant will define the authorities of the Downstream Regulator to promote competition and to reduce barriers to entry. The Consultant will also develop regulations for the of monitoring of arrangements to ensure that all marketers have ready access to product in each market, on non-discriminatory terms. In addition, specific regulations for both regulating charges one oil company makes to another, (e.g. for storage and for pipeline transport) and for intervening in any anti-competitive situation will also be defined.

3. Access to Product on Islands Without Adequate Refining Capacity

Specific regulations will be defined to ensure here that there are adequate arrangements for providing non-discriminatory access to product, through, for example, joint procurement, or the dominant marketer making product available to others at a reasonable cost. This will also include fair access to marine facilities and shore storage

for the new entrant, until such time as it has been economically able to build its own facilities.

4. Access to Product on Islands with Adequate Refining Capacity

The regulations will also include provisions that all marketers have access to the refinery product on equal terms, both at the refinery itself and from any pipeline system.

5. Open Access

The Consultant will develop specific regulations for ensuring open access to import facilities, storage, pipelines etc, the principles of charging and the situations in which open access is mandatory. These basic rules should be incorporated into the Business License.

6. Award and Renewal of Licenses

Under this area, the Consultant will develop regulations for providing different licenses for different groups of products (the main products, and separately for aviation fuels, lubes, bitumen) and different licenses for marketers as opposed to retailers, and for those who are importing for own use and will not be trading. There should be Licenses for refining, for importing, for transporting by pipeline, for transporting by road or rail, for storing, for marketing/distributing and for retail. A License applicant must satisfy the Downstream Regulator (including requirement to invest), and the need for an applicant for a marketing license to build (or contract for) his own storage. Licenses should be non-exclusive and automatically awarded to qualified applicants. The Downstream Regulator is not to question the economic merits of the proposal, or the impact on others, but only whether the applicant has the experience, will observe the technical (e.g. safety) and tax requirements, etc.

7. Security Stocks

It is a typical practice for the private sector to maintain security stocks at its own expense, including contractual arrangements whereby one private sector party would be permitted to maintain stocks on behalf of another. Such stocks need not be in separate tanks, and they must be actively turned over. The Consultant will define procedures for how these stocks have to be diversified across relevant key islands where the company concerned is active. In view of the closeness of international refineries and the existence of Indonesia's own crude and refineries, these security stocks could be lower than OECD norms. Therefore, the Consultant will set out standards for the periods allowed for achieving these stocks.

8. Severe Product Shortages

The Consultant will define the criteria for the prioritization of product uses and the compensation to the supplier (to ensure its supply, not just to counter international price movements). The appropriate prices would be the applicable international prices plus supplier's normal markups. The regulations, therefore, define when and under what circumstances such provisions would come into effect.

- 9. Anti-Contamination**
In this area, the Consultant will define regulations for controlling illegal mixing and use of product, with appropriate fines and penalties for any such violations.
- 10. Downstream Regulator's Right to Information**
The Consultant will describe detailed procedures under which the downstream regulator may obtain required information. Specifically list the information which a licensee is obliged to supply to the Regulator, including any provisions for confidentiality (normally not appropriate, however, unless it relates to individual customers).
- 11. Petroleum Product Specifications**
The Consultant will specify regulations regarding the details of lead and sulfur reduction programs, as well as programs to bring all specifications into line with international standards.
- 12. Ex-Refinery Prices**
The Consultant will develop procedures for a system for setting *ex-refinery prices* or whether each refinery is expected to make itself competitive with international supply. If there is to be a system for ex-refinery prices, then it should be defined. The Consultant should define the adjustments that should be made to ex-refinery prices in case the products are not in line with international specifications. This will include the method to determine prices for crude supplied to a refinery (same FOB as it can get for exports for otherwise exportable crude, plus freight, etc
- 13. Retail Price Control**
If it is decided to have a retail price setting system, the Consultant will provide details of how this would work. The Consultant will define the criteria and the procedure for moving from fixed prices to ceiling prices when warranted. It is absolutely essential to have reliable, prompt and frequent price adjustments for changes in import price/ex-refinery price. The Consultant will also define locations where prices are controlled, for example, at the ports, at the locations of the refineries, and at the ends of the pipelines.
- 14. Health, Safety and Environment**
The Consultant will define procedures for dealing with oil spills. These may include establishing specifications for road and rail tankers and, in particular, the need for regular independent inspections.
- 15. Independent Verification**
The Consultant will develop procedures for independent professional verification to ensure the accuracy of measuring devices, pumps, etc. In addition, develop procedures for independent verification of product quality.
- 16. Transitional Provisions**

Under this section, the Consultant will clearly set out the provisions for the transition of Pertamina. These will include descriptions of (i) the role of Pertamina during the transition period, (ii) the duration of such a transition period, (iii) a program of divestitures, and (iv) the objective of such divestitures.

The Consultant will closely work with the Directorate general of Petroleum within the MME and Pertamina throughout this task.

Deliverables

This effort will be carried out over a six month period. The Consultant will provide the following deliverables as part of this Task Order:

1. A Detailed Work Plan to the MME within two weeks after starting the work
2. A Mid-term Briefing to the MME at the end of three months.
3. A Draft Report at the end of five months.
4. A Final Report at the end of six months.

Indonesian Counterpart

The Indonesian counterpart for this study will be the Ministry of Mines and Energy in Indonesia.

Level of Effort

The proposed TA should be completed within 5 months from start. The following labor categories and hours are estimated for this task Order

1. Energy Regulatory (0002)	150 days
2. Energy Law (0002)	40 days
3. Energy Policy (0001)	80 days
4. Environmental Law (0002)	30 days
5. Energy Financing and Contracts (0007)	30 days

TOTAL DAYS 330 DAYS

Proposed Budget

A total of \$450,000 is proposed as the budget for this technical assistance. This includes approximately \$330,000 in labor and \$120,000 in other direct costs including the cost of local experts.

Energy Sector Tariff Reform and Subsidies Targeting

Background

The total subsidy required for the energy sector in Indonesia has been and continues to be a staggering drain on the state budget. During the past few decades of strong economic growth, the country's policy makers could continue to turn their attention away from the truly difficult decisions required to eliminate the energy subsidies. However, the economic crisis has further exacerbated the subsidy problem. Some of the price distortions and government's pattern of heavy subsidies are demonstrated by the following:

- The official prices of kerosene at the Pertamina depot is Rp. 280/liter (approximately 12 U.S. cents/gallon).
- PLN's delivered electricity cost is about \$0.06 per kWh, while the average revenue is currently about \$0.02/kWh.
- PGN, the natural gas company, is dependent on gas purchase from Pertamina at international prices in U.S. dollars, but then must sell the gas at Rupiah prices set before the crisis, and with little hope of being able to sell at rationalized prices in the near future.

In the immediate time frame, the GOI has no option but to consider continuing these subsidies to address differences between energy production costs (or the opportunity costs based on world prices) and the domestic selling price. It is extremely important that these subsidies be carefully targeted so as to address the problems of the most needy and to begin the process of subsidy removal. In the longer term, as the restructuring program in the power sector and the oil/gas sectors are implemented, and true competition finds its place in the Indonesian market, prices will have to begin to rise to their efficient levels.

Overall multi-fuel tariff and subsidy issues have not been broadly addressed in depth within a comprehensive framework for some years, and not within the context of the current economic crisis. In addition to the key role of energy pricing and the subsidy burdens within the current economic crisis, there is an urgent need for immediate work in this area to help assess GOI's planned major policy interventions to improve the energy sector efficiency in the country. It is crucial to understand the relationship between these interventions, alternative tariff strategies, and their impacts upon subsidies and on the consumer groups dependent on such subsidies.

The Asian Development Bank and the World Bank are extensively involved in pricing reform and the issues surrounding both power and hydrocarbon pricing in Indonesia. ADB has just completed a study in the power sector -- Electricity Tariff Rationalization Study. This study addressed both the supply side costs as well as the sector impacts of tariff changes and subsidy changes. The results of this study, and results from the proposed USAID study will need to be coordinated carefully with the work being carried out by the Electricity Sector Restructuring Secretariat of MME, and the major Technical Assistance program under the ADB Social Safety Net Loan. One of the projects under the ADB TA program will address the issue of building

public acceptance for the initial price increases that will narrow the gap between prevailing prices and cost-based prices.

The World Bank has indicated that it is in the process of reviewing hydrocarbon pricing issues, with emphasis on obtaining a better picture of supply-side costs in the oil and gas sectors. It is, therefore, important that the USAID-supported pricing study be carefully designed and coordinated with these simultaneous efforts.

Policy-oriented studies of this type have historically not been carried out in the Office of the Minister of Mines and Energy, but rather within one of the Directorate Generals, or within the framework of one of the energy policy committees or bodies, e.g., BAKOREN. Minister of MME, Minister Kuntoro, has a strong interest in developing a greater policy analysis capability in his office. Basing within his office the management and major analytic activities of this planned pricing study would constitute a significant step in the building of this analytic capacity on a more substantive and sustainable basis. To achieve this, priority will be given to major use of local senior professional expertise in conducting the pricing study.

Objectives

Provide technical assistance in broad-based electricity tariff rationalization study, including life-line mechanisms, in order to address overall pricing reform in the power sector. In addition to its direct substantive value in the policy arena, the proposed study will contribute significantly to the process of building a policy analysis capability in the within the MME.

The study's primary objectives will be as follows:

- Creation of overall policy and analytic framework for conduct of pricing and subsidy study. This will include an elaboration of key policy issues to be addressed and their relationship to energy pricing and life-line mechanisms. Particularly important is elucidation of issues according to the feasible time frame of pricing/subsidy policy implementation. Short-term policies will be directed toward addressing recovery from the current economic crisis and long-term policies will be directed toward establishment of a sustainable market framework and eventual subsidy elimination.
- Development of the foundation for key pricing and life-line policy analyses, including the following issues:
 - Cleaner fuels and differential pricing
 - Fuels pricing contracts with PLN
 - Pricing and captive power issues
 - Kerosene and LPG pricing including impacts of tariff on cooking by rural/urban users and the mixing of diesel with kerosene
 - Diesel Pricing (markups due to margins of middlemen, VA taxes, etc)
 - Relationship of fuels/electricity pricing to restructuring of electricity and oil/gas sectors
 - Transport fuels sector issues, including unleaded gas

- Integrated time-phased strategies for price rationalization with focus on assessment of enhanced energy sector efficiency, sharper subsidy targeting, and broader public participation and acceptance of the resulting programs
- Development of a key building block of policy analysis in the MME

Terms of Reference

The selected contractor will carry out the following specific tasks:

Specific Tasks

1. Establishment of an institutional framework for study, both in the Minister's office and with local/expatriate consultants, including the identification of analytic tools and data base for implementation of study
2. Identify key policy issues and questions which need to be addressed and which depend on an understanding of the impacts of various tariff levels and structures. Work with broad spectrum of stakeholders.
3. Review of current situation for the hydrocarbon fuels including the following:
 - -Review present procedures for establishing prices for petroleum products
 - -Review the framework and data for determining costs of petroleum products
 - -Assess impact of subsidies on use of PP and NG
 - -market distortions
 - -creations of barriers to a market-oriented environment
4. Analysis of Subsidy Elimination including the following:
 - -Analyze impact of subsidy elimination , assuming alternative time-paths of subsidy elimination and development of the down-stream market. Examine direct impacts on consumer sectors with emphasis on urban and rural households, particularly vulnerable and low-income groups (explicitly, kerosene and LPG issues). The analysis will include the following:
 - -Diesel Pricing
 - -Transport Sector (Impacts of transport fuel pricing on groups of users, modal impacts, socio-economic impacts, private vehicles, and public transport, and regional differences
 - Unleaded gas
 - -Evaluate pricing impacts on major industries with long-term pricing contracts, such as fertilizer and steel producers

5. Review the results of the ADB Electricity Tariff Rationalization Study, its assessments of existing subsidies, the impacts of tariff adjustments, and resulting time-dependent strategy formulations for tariff rationalization. Make recommendations on alternative strategies in short and mid-term. The assessment will include the following:

- -Assess impacts of fuel supply pricing contracts with PLN, fertilizer plants, steel, etc.
- -Develop policy recommendations on alternate strategic approach to tariffication
- -Captive Power (Assess the current importance of i) reliability and ii) price of fuels and power and assess the impacts of alternative fuel and power pricing on captive power)

6. Results workshops and development of stakeholder implementation program, organized by Minister's Office, within framework of key policy issues.

Deliverables

The selected contractor will provide monthly progress reports and interim reports at the end of every 3 months. At the end of 4 months, the contractor will provide the MME alternative models for subsidy targeting¹² that will be utilized by the MME in implementing the initial 2 price increases, while the pricing study is being carried out. The development of subsidy targeting will assist the Government in building public acceptance for these initial tariff increases.

The contractor will submit a Draft Final Report at the end of 8 months and a Final Report within one month after receiving comments from the Government.

The study will be carried out over a 9 month period.

Counterpart in Indonesia

Because of the national importance of this study and its sensitivity to the public, the study will be carried out under the direct supervision of the Minister and his senior advisors.

Level of Effort

This study will require approximately 16 person months of expatriate effort and 10 person months of local effort over a 9 month period.

1. Energy Economist (0006)	180 days
2. Energy Policy (0001)	60 days
4. Energy Financing (0007)	30 days
5. Research/Modeling (0006)	80 days
TOTAL DAYS	350 DAYS

¹² The reason for "subsidy targeting", a phrase deliberately chosen is that there is no way that the GOI can or should eliminate all subsidies even under the best of circumstances. Some subsidy will have to be maintained to protect the poor and isolated consumers. Therefore, it is a social issue and the objective here is to target the subsidy to the needy. Hence the phrase "subsidy targeting". Subsidies, by and large must be removed as part of the MDB and IMF conditionalities.

In addition, the study team will include 200 days of local effort in research and economic modeling.

Proposed Budget

A total of \$600,000 is proposed as the budget for this technical assistance. This includes approximately \$400,000 in labor and \$200,000 in other direct costs including the cost of local experts.

Technical Assistance to the DGEED for Quick Implementation of ADB TAs

Background

As part of the \$400 million Social Safety Loan, the Asian Development Bank is financing the following eight Technical Assistance (TA) activities:

1. Developing a Competitive Electricity Market - Market Rules
2. Developing a Competitive Electricity Market - Financial Settlement
3. Developing a Competitive Electricity Market - Software Specifications
4. Developing Computer Software for Operation of a Competitive Bulk Electricity Market
5. Providing Support for Development of Power Sector Regulatory Capabilities
6. Providing Support for the Power Sector Restructuring Secretariat
7. Assisting in Building Acceptance of Electricity Tariff Increases
8. Strengthening Consumer Participation in a Competitive Electricity Market

The overall objective of the ADB Loan is to strengthen the capacity of the Government and PLN to facilitate establishment of a competitive electricity market. The ADB policy has required that only project preparatory TAs be financed by TA loans. Therefore, ADB is unable to provide TA to the MME for implementing the procurement of the consultants under the TA. Both the ADB and the MME have requested that USAID provide assistance to the MME in order to expedite the procurement of consultants to implement all the TAs as soon as possible.

In view of the urgent and substantial capacity building needs in the context of establishing a competitive electricity market, the Government has specifically requested the ADB to provide the proposed TA loan for Capacity Building for Establishment of a Competitive Electricity Market. USAID assistance is needed to support the implementation of the procurement under the TA urgently.

Objective

The objective of the proposed USAID assistance is to provide assistance to the DGEED, the executing agency for the ADB financed TAs, to procure the consultants under the TAs in accordance with the ADB Guidelines for Procurement of Consultants.

Terms of Reference

The contractor is required to provide expert(s) to assist the DGEED in the following areas:

- Assist the DGEED in the preparation and issuance of Requests for Proposal (RFPs) for all the eight TAs in accordance with the TA descriptions developed by ADB in consultation with the GOI.

- Develop detailed procedures for bid evaluation including transparent statements for qualifications requirements and selection criteria for shortlisting consultants, and bid evaluation criteria and procedures for the selection of the consultants.
- Once the bids are received, assist the DGEED in the evaluation of the bids in accordance with the pre-established bid evaluation criteria.
- Assist the DGEED in documenting all aspect of the bid evaluation and the procurement process.
- Assist the DGEED in ensuring that the bid process is consistent with ADB guidelines and coordinate the process with ADB contracting personnel and technical officers as stipulated in the ADB Loan Document.

Deliverables

The selected contractor will be responsible for providing the services of procurement expert(s) familiar with the ICB procedures and ADB Guidelines for procurement of Consultants to assist the DGEED over a period of 12 months. The experts will provide services to the DGEED and document their services in topical reports submitted to the USAID.

Counterpart in Indonesia

The Directorate General for Energy and Electricity Development within the Ministry of mines and Energy will be the executing agency for this technical assistance.

Level of Effort

The proposed assistance will be provided over a 12 month period and the level of effort is expected to be approximately 5 person months. The scheduling of the TA selection process will require multiple trips to Indonesia.

Proposed Budget

The proposed budget for this technical assistance is approximately US \$110,000 in labor and US \$30,000 in other direct costs.

URBAN AND ENVIRONMENTAL MANAGEMENT

Jakarta Air Improvement Project and the Introduction of Unleaded Gasoline Action Plan

Background

According to the World Health Organization, more than one billion people live in unhealthy air in urban areas. The World Bank has estimated that between 300,000 and 700,000 premature deaths could be avoided worldwide if particulate levels alone were reduced to the levels proposed by WHO guidelines. In Jakarta, where concentrations of particulate are very high, it is estimated that particulate matter less than 10 microns in size (PM10) caused more than 4,000 excess deaths in 1990, equivalent to four or five percent of annual deaths in the city. Most of this pollution is caused by fossil energy in one form or another with transportation often the largest contributor.

One of the most important pollutants is lead particle, a well-recognized threat to human health and ecosystems. There is no safe level of exposure. One hundred percent of the atmospheric lead in Jakarta is from motor vehicles using leaded gasoline. Lead concentrations well above the WHO guidelines are experienced in many areas of the Jakarta, particularly in those areas exposed to heavy traffic.

The deteriorating air quality in many of urban areas, including Jakarta, is a result of the great increase in population, rapid economic expansion, increased industrial fossil fuel use and the resulting emissions, and the tremendous growth of passenger vehicles. In Jakarta, the main and fastest growing contributor of air pollution is the transport sector, followed by emissions from industry and domestic cooking. These emissions are seriously affecting the well being of city dwellers, imposing not just a direct economic cost by impacting human health, but also threatening long-term productivity. In the longer term, the continuing growth in urban use of fossil fuel will contribute increasingly to the emissions of the greenhouse gases and other pollutants.

The dynamics of the development of urban systems, such as in Jakarta, will play a key role in influencing the sustainability of development at the global level. The question of urban sustainability has not been sharply focused in the global discussion of sustainable development, in part because governments are widely perceived as relatively helpless in stemming the rate, the location, and the form of urbanization.

a. Development of an Air Quality Improvement Program

Actions leading to the achievement of this objective would include technical and other measures that would reduce the human exposure and damage from pollution. It would also address broader issues such as transport demand management and the improvement of the efficiency of energy use in industrial plants. The program would seek to achieve these objectives through the

fostering of public/private initiatives in the Jakarta metropolitan area, leading in the long-run to an energy- efficient urban infrastructure.

b. Design and Implementation of a Program for Lead-free Gasoline

There have been successful experiences with the introduction of unleaded gas in several other countries in Asia. The World Bank and various institutions within the GOI have explored the development of an action plan for the elimination of leaded gasoline in Indonesia. The achievement of this objective will require a collaborative approach involving key stakeholders and decision makers, including several government agencies, the oil sector, the public, and the appropriate segments of the passenger vehicle industry.

The above two components clearly have similar motivations and strong interrelations. In fact, in many countries with severe urban air pollution problems, e.g., Thailand, unleaded gasoline was introduced as part of a broader on-going strategy to reduce vehicular emission and improve air quality. For this reason, the ULG program is being carried out parallel to the more broadly-targeted air quality management program. This approach, while not retarding the highly targeted ULG program, will allow the seizing of concomitant opportunities to achieve collateral goals.

The two components of the program are summarized below, including estimated resource requirements for FY 1999 and FY 2000.

Development and Implementation of Jakarta Air Quality Improvement Program

Objectives

The primary objective of this work is the reduction of air pollution impacts in Jakarta through an air quality management and monitoring program, while fostering the development of an urban and energy infrastructure consistent with long-term sustainable development. Air quality management initiatives will be identified and implemented within a comprehensive strategy which addresses the additional goals of energy efficiency improvements and the reduction in potential increases of emissions of greenhouse gases. In addition, the program will be developed within a community participatory framework which stresses comprehensive stakeholder participation and transparency in decision making. This broad public participation will be particularly important in implementation of critical social policies, e.g., the elimination of fuel subsidies, which affect the economic well-being of a broad class of urban energy consumers

Given the above framework for this program, it will be important to establish from the beginning the appropriate institutional framework for the project, and a consistent overall project strategy and implementation plan. Key elements of a several year program are described below.

Terms of Reference

1. Establishment of Institutional Framework for the Project

Assessment and control of pollution are key cornerstones of an air quality management system (AQMS). A prerequisite to the establishment of these cornerstones is the establishment of a

robust institutional framework which will remain effective and sustainable throughout the several year time-period need to implement the AQMS. Key elements of this effort are:

- ***Establish Relationship with Counterpart Government Bodies.*** In addition to the private sector and the public at large, there are a large number of government agencies which have direct involvement and strong interests which will ultimately be impacted by establishment of an effective AQMS. An initial activity of this project will be to establish the governmental framework for the project. There are some already existing nascent frameworks in the GOI which may be appropriate, e.g., the Jakarta "Clean Air Coordinating Team". Another possibility is to draw upon previous work in the "Third Jabotabek Urban Development Project" (JUDP III), financed by the World Bank, which led to the development of an "Environmental Protection and Pollution Control Strategy and Action Plan. The project was coordinated by BAPEDAL.

The likely participating government agencies will include various bureaus of DKI, such as the Bureau of Environment, Urban and Environmental Assessment Department, Traffic and Transportation Department, and City Planning Department; the Ministry of Environment; Ministry of Transport; Ministry of Health; EKUIN; the University of Indonesia; and the ITB.

As described earlier, the proposed Indonesia Program for Unleaded Gasoline will be closely coordinated with the AQMS project. It is anticipated that the central government will take the lead in that project, with BAPPENAS likely playing a central role.

- ***Identification of Key Stakeholders.*** The composition of stakeholders in a region such as the Jakarta metropolitan area is particularly diverse and complex. An early effort in the project will be to identify key stakeholders and to catalyze their long-term participation within the project.
- ***Development of Project Strategies.*** Over the past decade, a number of technical assistance projects have identified various urban environmental project, including programs which fit within the framework of the proposed AQMS. This work, in addition to current ongoing assessment efforts within the GOI, could form the starting point for the development of a project strategy. An important initial effort of the JAIP will be to embed these initial programs within the institutional framework described above and to develop an overall project strategy. This effort would be managed by the Project Coordination Unit, established within an appropriate GOI counterpart agency, with the assistance of a USAID consultant (contractor). The project coordination unit would facilitate stakeholder inputs and consensus formation, through workshops, study tasks, etc. leading to the development of project priorities and specific project elements.

Jakarta has approximately 20 air quality monitoring stations. In varying degrees of comprehensiveness, they provide measures of particulate, (including PM 10), Nox,

SO₂, Ozone, CO, and lead. Previous projects, including several world bank studies, have drawn upon this monitoring data to assess a wide variety of action measures. The project will build upon this previous work to prioritize, recommend, and move toward implementation of specific measures and demonstration projects. This would include the formal establishment of an AQMS.

Current and previous studies (e.g., the World Bank's URBAIR and SURIP projects) have identified a wide range of initiatives and projects targeted toward improved air quality. Most of these initiatives fall into one of the following categories:

- Improve Fuel Quality
- Technology Improvements
- Fuel Switching
- Traffic Management
- Transport Demand Management

Specific management strategies and projects will be identified and designed, including the development of funding and implementation plans.

- ***Phased Implementation of Pilot Projects.*** After the implementation process has been established, a phased implementation process can be set in motion. The Unleaded Gasoline Project will be a key initial pilot project of high priority.

Counterpart in Indonesia

As mentioned earlier, a number of ministries, private entities, and NGOs may be involved in this project. USAID should continue a dialogue with BAPPADEL, the Ministry of Environment, to identify an executing agency for this study.

Level of Effort

It is anticipated that this study will be carried out over a 24 month period and will require approximately 12 person months of expatriate effort and 30 person months of local expertise.

Proposed Budget

The total proposed budget for this technical assistance is US \$500,000 including all other direct costs. Of this amount, US \$150,000 is recommended from FY 1999 funds and US \$350,000 is recommended from FY 2000 funds.

Development and Implementation of a Program for Unleaded Gasoline in Indonesia

Objective

There has been ample research and epidemiological evidence developed over the past decades to demonstrate the health impacts caused by lead emissions from gasoline powered vehicles. Since the early 1970s, the world has witnessed a steady movement toward reducing lead in gasoline, and in many countries eliminating it completely. The ultimate objective of this program is the reduction of air pollution impacts through the phase-out of leaded gasoline in Indonesia.

Terms of Reference

A wide variety of countries have successfully implemented the introduction of unleaded gasoline in an efficient and relatively short period of time. Worldwide, more than 85 percent of new cars require the exclusive use of unleaded gasoline to protect their emission control systems. In southeast Asia, Thailand has had one of the notably successful implementation programs, which phased out leaded gasoline in a five year program beginning in 1991, culminating in 1996 with a complete ban.

Several major studies carried out in Indonesia in the past several years have convincingly demonstrated the efficacy and urgency of a timely implementation of a program for unleaded gasoline. In particular, the World Bank has played a strong role in helping to establish the awareness of this need and in providing much of the basic information needed to catalyze such a program. The time has arrived for the Government of Indonesia to move ahead with the development of the program. USAID Jakarta has made the decision to act as the initial coordinator to assist the GOI with this program.

- ***Establishment of Institutional Framework.*** In addition to the private sector and the public at large, there are a large number of government agencies which would have direct involvement and strong interests in the ULG. An initial activity of this project will be to establish the governmental framework for the project. The World Bank has already been active in an effort to stimulate the organization of a framework for this within the Indonesia government. Because the ULG component of the overall air quality programs will be national in scope, and require cooperation from Pertamina, the auto industry etc., the central government will take a leading role. Nevertheless, the Jakarta regional government will also be central to the effort. Anticipated government counterpart bodies include BAPPENAS, MME, Pertamina, EKUIN, and the Ministry of the Environment.
- ***Development of Strategy and Implementation Plan.*** A key element of getting this project off the ground will be to successfully target the stakeholders, identify the key decision makers, and create the appropriate discussions arena, leading ultimately to establishment of a consensus on the development of a strategy and implementation plan. Although a similar approach has been used successfully in other countries in Asia, it will need to be designed specifically for the particular characteristics of the Indonesian situation. It will also depend upon the identification of a government body or individual who will assume a strong leadership role. For example, in Thailand, the National Energy Policy Office (NEPO), acting as secretariat to the

National Energy Policy Council, had a critical role in developing the strategy to introduce ULG, and after developing a commitment to the ultimate objectives, assumed and maintained a strong management and leadership role throughout the entire several-year implementation process

Key elements and issues in the implementation process include:

- Regulatory Standards
 - Fuel Quality Specifications
 - Refinery Requirements
 - Distribution, Marketing, and Public Relations
 - Pricing and fiscal Incentives
 - Cooperation of Passenger Vehicle Industry
 - Public Information, Education and Training
- ***Phased Implementation and Key Actions.*** After the implementation process has been established and the key support elements put in place, a phased implementation process can be set in motion. The process should entail as many firm targets as possible, in order to focus efforts and maintain momentum, but should nevertheless recognize the need for a flexible approach.

Counterpart Agency

USAID should consultant the GOI for the establishment of a coordinating unit within an appropriate agency in Jakarta.

Level of Effort

It is anticipated that this study will be carried out over a 12 month period and will require approximately 20 person months of expatriate effort and 42 person months of local expertise.

Proposed Budget

A total of US \$800,000 is proposed for this activity, of which US \$300,000 is proposed from FY 1999 funds and \$500,000 is proposed from FY 2000 funds.