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**TECHNICAL ASSISTANCE IN THE PETROLEUM PRODUCTS SECTOR**

**XP/GBS/88/064/11-01**

**GUINEA-BISSAU**

**Executive Summary\***

**THE REVIEW AND RECOMMENDATIONS**

**ON**

**THE IMPORTATION, THE STORAGE, THE HANDLING, THE TRANSPORTATION  
AND DISTRIBUTION OF PETROLEUM PRODUCTS AND DEVELOPMENT OF  
ALTERNATE ENERGY SOURCES IN GUINEA-BISSAU**

Prepared for the Government of Guinea-Bissau  
by the United Nations Industrial Development Organization  
acting as executing agency for the United Nations Development Programme

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**Note:**

This document is an executive summary of reports by T.M. Lillico "A Review of the Hydrocarbon Industry, Guinea-Bissau" and H. Baba Ahmed "The Review of and Recommendations on the Importation, the Storage, the Handling, the Transportation and the Distribution of Petroleum Products in Guinea-Bissau". These reports have been written after both consultants visited Bissau in January and February 1989.

This document lists their major findings and recommendations for details, refer to the consultants reports. As can be noted, action items are numerous and certain works have to be carried out on a comprehensive basis and not on a one-by-one basis. UNIDO is ready to review with the Government of the Republic of Guinea-Bissau, the action items on a selection and priority basis for their timing and their implementation. At the same time the Ministry of National Resources and Industry should expediate those action items that require a government decision on those action items that can be undertaken without the assistance of UNIDO.

## INTRODUCTION

Guinea-Bissau's economy relies heavily on the import, storage and distribution of petroleum products used for power generation, industry, transport, farming, fishing, illumination, artisanal activities and cooking.

Economic development cannot be achieved without schedule fuel imports to match the country's needs; without safe and secured facilities to store the imported products and without the safe handling and adequate distribution and storage of products in consumer sales points throughout the country.

Due to limited foreign currency earnings the country suffers from:

- Lack of fuel resulting in electric power outages and rationing;
- Unsafe and unsecured storage depots at DICOL and GUINEGAZ;
- Lack of adequate transport fleet and a total lack of river transport to sales points, outside the capital, that can only be reached by barges during the wet season;
- Insufficient sales points, or total lack of sales points for butane in the capital and in regional centers;
- Inexistence of storage and distribution depots in rural areas;
- Total lack of maintenance, total lack of vital spare parts and replacement equipment;
- Lack of adequately trained personnel for the safe handling of hydrocarbon products;
- Lack of supervisory personnel to oversee the operation and maintenance of existing facilities.

To safeguard its present assets and to spur economic activity, Guinea-Bissau needs to do the following:

- Rehabilitate its petroleum product depot at DICOL and its butane storage depot at GUINEGAZ. By any standard these facilities have outlived their useful lives since they have been built more than 20 years ago.
- Train or hire qualified personnel to run the existing facilities in accordance with industry standards and regulations.
- Invest in the adequate distribution and storage of products in regional centers.

To ease the burden of fuel imports and to preserve its forests which are being depleted of their wood for cooking Guinea-Bissau needs to:

- Discourage fuel theft;
- Rehabilitate its electric power transportation and distribution networks;

- Invest in the construction of hydroelectric power plants;
- Encourage the private sector (local as well as foreign) to invest in the import, storage and distribution of petroleum products;
- Encourage petroleum exploration;
- Introduce electric power generation by burning of farming residues;
- Introduce better charcoal making techniques and more efficient household stoves.

To generate foreign currency income the country ought to:

- Tax fuel and lube imports by private concerns in foreign currency;
- Tax vehicle and engine-generator imports by private concerns in foreign currency;
- Introduce a fuel value added tax, in US dollars, for international fishing vessels in its waters; revenues from this tax will be used for the building of a fishing port to supply these vessels with fuels and other necessities;
- Build up its reserves in jet fuels for resale, at a profit, to international carriers;
- To increase productivity and to generate profits (i.e. both GUINEGAZ and DICOL can be considered bankrupt by normal accounting standards), the two state-owned companies ought to be either sold or combined under one single entity and managed by an outside management firm until they show profit and new management skills have been organized by trainees during the stay of the outside management firm. In any case the new company ought to be independent by Government control (i.e. no credit allowed to bad-paying customers and revenues and prices controlled totally by the company).

MAJOR OBSERVATIONS AND RECOMMENDATIONS

1. STORAGE CAPACITY

1.1 DICOL Depot

- Per present import pattern, constrained by lack of foreign currency, the security stock-days are more than the required 75 to 90 days recommended by industry standards.
- Per estimated beyond which has been evaluated at (in m3):

	1990	1995	2000
Diesel	45,700	63,540	85,233
Diesel with Saltinho dam	45,700	44,800	60,140
Gasoline (super)	10,080	16,300	24,480
Lube Oil (in tons)	500	718	984

Additional storage capacity will be required: 10,000 m3 for diesel and 3,200 m3 for gasoline at approximate costs of US\$ 400,000.

1.2 Service Stations

- Additional service stations are requested throughout the country to satisfy customers' needs. By 1990 it is estimated that 11 service stations will be required at approximate costs of US\$ 400,000.

1.3 Regional Centres

- To get fuel to customers in urban areas, especially during the wet season, regional storage depots are required. A storage capacity of 600 m3 for gasoline and 850 m3 for diesel will be needed by 1990 at approximate costs of US\$ 600,000. A one 100 DWT barge will be needed to transport fuel to the various depots throughout the country. The barge will cost between US\$ 1,500,000 and 2,000,000.

1.4 GUINEGAZ

- GUINEGAZ has 700 t of butane storage capacity which is adequate for the present demand. However, all of the customers' cylinders are more than 20 years old and ought to be replaced. The replacement cost of the 3000 13-kg and the 500 55-kg cylinders is estimated at US\$ 700,000.
- In addition to get the cylinders to customers sales points, two trucks ought to be purchased at approximate cost of US\$ 50,000.

2. REHABILITATION/REVAMPING OF FACILITIES

- 2.1 An Engineering Contractor should be hired to design and oversee the revamping of DICOL's and GUINEGAZ' facilities. The design and construction period will last approximately 18 months. The cost associated with the Engineering Contractor will be approximately US\$ 650,000.

## 2.2 Unloading/loading facilities at DICOL

- Unearth all buried piping and verify that it is properly coated and wrapped.
- Vehicle cross-over steel structure at south-eastern of the depot is about 3 meters wide; extend width to 5 meters.
- Replace all buried piping, under road, running from tank farm 1 to tank farm 2 and future tank farm 3 being built presently by the Cubans.
- All old piping should be replaced to avoid contamination of products by internal deposits.
- Paint all above grade piping and color code.
- Tag all lines and all valves.
- As products are moved through flexible piping, in header area, considerable spillage occurs. For safety and for less product loss it is recommended that the flexible pipes be discarded and permanent piping, with all necessary bypasses for transfer and loading, be installed.
- Install pipe anchors on pipelines between the terminal and the barge landing platform.
- Install drain valves at lowest point of product pipelines at the lowest grade point near the terminal.

The costs associated with the above works will be approximately US\$ 40,000 of equipment.

## 2.3 Storage facilities at DICOL's

- Remove tanks 306 and 308. If this is not feasible, then both tanks should be emptied and cleaned internally.
- Empty all other tanks and inspect for sediment build-up, scaling, surface corrosion and pitting. Clean, repair, sandblast and repaint as per industry standards.
- Install separate inlet and outlet lines for ease of operation and to avoid product contamination.
- Inspect all P/V valves and repair or replace if necessary.
- Install sample taking facilities at terminal in product pipelines to check product quality during tanker unloading.
- Install filters and filter-separator inside the depot for incoming jet and aviation-gas fuels being unloaded from the tankers. With proper piping and recirculation pumps these same filters and filter-separators can remove any remaining water or sediments from the tanks.

- Check proper grounding of all tanks; check continuity of grounding mats at connection points and at ground rods; check electrical continuity at valves and piping flanges.

The costs of equipment associated with the above works will be approximately US\$ 100,000.

#### 2.4 Cooling System at DICOL

- Replace all loading pump-motor sets. Purchase one stand-by unit for each set with spare parts for two or three year operation.
- Remove all wiring in cable trench inside the pump house; clean and dry the trench.
- Remove all starters inside the building.
- Remove the start-stop pushbutton and its wooden box located next to the diesel pump-motor set and replace by an explosion-proof unit.
- Replace all filters.
- Replace all loading arms.
- Replace the two inoperative filter-separators.
- Replace the loading pump start-stop pushbuttons inside the pump house and at the loading arms platform.
- Replace the metering valves and hoses at the drum filling points.
- Close the depot to vehicle traffic. Use the service station for DICOL's vehicles only. Build additional service stations in the city of Bissau.

The costs of equipment associated with the above works will be approximately US\$ 200,000.

#### 2.5 Skimmer Separator/Slop System

- Replace all pumps.
- Reconnect and recommission the whole system.
- To prevent pollution of the river, place a branch line from the slop transfer line outside the depot to a burning pit south of the depot. The burning pit can also be used for fire-fighting drills.

The costs of equipment associated with the above costs will be approximately US\$ 50,000.

#### 2.6 Water/Foam/Fire-Fighting Facilities for DICOL

- Replace all well pump motor sets.
- Replace the diesel water pump set; install an independent fuel storage tank for this set.



- Connect the spare electric-motor driven pump to the system.
- Empty and repair the chemical storage tank.
- Check all buried piping for corrosion and pitting.
- Recommission pressure and surge tanks.
- Provide a sump pump to remove spilled water inside the water handling building.
- Install fire fighting turrets (total of 10) in all three tank farms, one at barge landing area and at least one at the terminal.
- Provide hand extinguishers (total of 20).
- Provide cart-wheel extinguishers (total of 5).
- Purchase spare parts for all equipment for two to three year operation.
- Conduct fire-fighting drills in conjunction with the city fire department.
- Install a separate hot telephone line to the city fire department.
- Install a fire siren with actuating buttons or handles at strategic locations.

The costs of equipment associated with the above works will be approximately US\$ 175,000.

## 2.7 Airport Facilities

- Recommission the two unused tanks.
- Check for differential pressure build-up on filter-separators and replace filter elements on a routine basis.
- Check and replace filters of truck servicer.
- Empty fueler trucks and check internal coating for corrosion.
- Purchase spare parts for fuelers that can be salvaged.
- If DICOL's policy is to increase sales, then another 20 m<sup>3</sup> fueler with a 20 to 30 m<sup>3</sup> trailer should be purchased.
- Check all fire extinguishers and replace those that cannot be recharged.
- Install a telephone hot line to the airport fire department.
- Install a telephone hot line to the airport fire department.
- Purchase spare parts for motor pump sets and filter elements.

The costs of equipment associated with the above works will be approximately US\$ 350,000.

## 2.8 Existing Filling Stations and Road Tanker Fleet

- Replace pump motor sets in existing service stations.
- Refuse to fill customer's plastic containers in service stations.
- Install adequate lighting.
- Replace fire extinguishers.
- Reccmmission abandoned service stations (Shell in Bissau, Mobil and BP in Bafata, etc.).
- Purchase 5 new road tankers equipped with meters.
- Purchase spare parts for service stations and road tankers for two to three year operation.

The costs of equipment associated with the above works will be approximately US\$ 350,000.

## 2.9 Safety

Total lack of safety by operators makes DICOL's depot prone to additional hazards and explosion. A safety engineer should be hired for 2 years to remedy the situation. The costs associated with the engineer will be approximately US\$ 200,000.

## 2.10 Fuel Loss and Fuel Theft

- Hire a "loss" prevention officer who will investigate fuel theft and who will answer only to government officials and to the Ministry of Justice.
- Provide metering facilities at all large customers such as AEGB, army, fishing fleets, etc.
- Provide meters at all loading arms.
- New road tankers should be purchased with integrated meters.
- Install meters on incoming product pipelines.
- Install laboratory equipment in lab room to test quality and density of products unloaded by ship tankers.
- Seal openings of road tankers leaving the depot.
- Confiscate bottles and plastic containers entering or leaving the depot; check contents of cars, buses and trucks leaving the depot.
- Install fence and perimeter lighting around all of the depot's facilities; patrol the area at night.

The costs associated with the "loss" prevention offices will be approximately 500,000 Pesos. The cost of equipment associated with the above works will be approximately US\$ 300,000.

### 2.11 Electrical Facilities at DICOL's

- Remove from utility room all abandoned generators and pumps. Remove also the lube oil tank.
- Replace all switchgear, control panels and motor control sections from the building.
- Extend the building to the East; or better build another utility building to accommodate also a maintenance shop and a garage for maintenance of DICOL's vehicles.
- Install a continuous duty generator to carry DICOL's load as well as GUINEGAZ base load. The approximate size of this generator is 150 Kw. CICER power supply will then be used as stand-by power.
- Install an emergency set to carry only critical loads and the electric fire pump. The approximate size of this generator is 50 Kw.
- Check the adequacy and the continuity of the grounding system.
- Run at least two ground cables to the pier and the terminal to form a ground loop; ground all lighting poles and junction boxes. Run ground cables to tanks 312, 313 to the two new 2,000 m<sup>3</sup> jet fuel tanks and the 50 m<sup>3</sup> aviation gas tanks.
- Replace screw-type bulbs in hazardous areas with mercury vapor or sodium-vapor lamps and with starters located away from the hazardous area or in explosion-proof enclosure or relocate the starters.
- Remove the start-stop switch by the diesel transfer pump; replace by explosion-proof design.
- Replace all wiring.

The cost of equipment associated with the above works will be approximately US\$ 420,000.

### 2.12 GUINEGAZ Unloading/Loading Facilities

- Replace the two incoming lines from the southeast corner of DICOL's depot to the metering shed.
- Replace the flow meter and strainers in the metering shed.
- Replace rusted flanges and valves.
- Replace the inoperative level gages.
- Replace the corroded piping in the drain lines.
- Sandblast corroded piping, prime and repaint.
- Sandblast horizontal vessels steel footings, reprime and repaint.
- Ground horizontal cylinders at footings separately.

- Install high level alarms on horizontal vessels and connect to horn alarm system.

The cost of equipment associated with the above works will be approximately US\$ 40,000.

#### 2.13 Bottling Facilities at GUINEGAZ

- Purchase two 3 HP transfer motor-pump sets with spare parts for two to three year operation.
- Replace corroded valves and flanges around the pumps.
- Replace the suction and discharge pressure gages at the pumps.
- Ground the frame of the electric motors.
- Replace the filling stations that have been stripped; purchase hose sets for those in operation; purchase spare hoses for two to three year operation.
- Replace paint baking oven and draft fan.
- Ground the frame of the air compressor motor.
- Sandblast, prime and repaint the piping.

The cost of equipment associated with the above works will be approximately US\$ 15,000.

#### 2.14 Water/Fire-Fighting System/Safety/Security at GUINEGAZ

- Replace the well pump-motor set.
- Replace the 20 Hp electric motor-pump set.
- Replace the 20 Hp diesel-engine motor pump set.
- Replace corroded pipe and pipe that has been dismantled.
- Purchase 6 hand fire extinguishers.
- Purchase two cart-wheel dry powder fire extinguishers; place one in transfer pump area and one in cylinder filling area.

The cost of equipment associated with the above works will be approximately US\$ 45,000.

#### 2.15 GUINEGAZ Electrical Facilities

- DICOL's new switchgear and generators should be sized to carry GUINEGAZ loads.
- Remove the distribution board; purchase a new switchgear (in the case of a new generator) and motor control center to be placed in an extension of the control building or a new building; leave the maintenance room to storage of spare parts, maintenance tools and minor repairs.

- Replace all flood lights and ground all lighting pole frames.
- Ground all motor frames and electrical devices.
- Check the bonding and electrical continuity of piping.
- Provide perimeter fence lighting.
- Remove the general-purpose light switch and the floodlights in the cylinder filling area.

The cost of the equipment associated with the above works will be approximately US\$ 35,000.

### 3. ORGANIZATION DEVELOPMENT

#### 3.1 Organization Structures

If DICOL and GUINEGAZ are not sold to private concerns, they should be restructured under one single management responsibility. Thereafter, either the management of the company ought to be done by an outside firm for 2 years. During this period, people will be trained to take over the management of the company. The costs associated with this operation will be approximately US\$ 600,000.

#### 3.2 Maintenance at DICOL and GUINEGAZ

- Construct a new building East of the depot and South of GUINEGAZ facilities to house: maintenance shops, road tanker fleet and a garage. This building can also house the new generators and the new switchgear and motor control center for both DICOL and GUINEGAZ.
- Remove and dump outside the depot all unsalvageable vehicles, all scraps and abandoned loading arms, fire hydrants, etc.
- Grade the area south and outside the depot for storage of pipe, cable reels, valves fittings, etc.
- Provide in maintenance shop equipment and tools for maintenance, minor repairs and testing.

Equipment costs associated with the above works should be approximately US\$ 40,000.

### 4. TRAINING

Training should be conducted for: accounting, computers, quality control, safety, operations and maintenance. The costs associated with this training will be approximately US\$ 62,000 and 21 million pesos for DICOL and US\$ 265,000 and 16.5 million pesos for GUINEGAZ.

## 5. RAISING OF FUNDS/ATTRACTING FOREIGN CURRENCY

- Recommend that the products imported by private concerns and users should be taxed; a 200 US\$/ton would produce US\$ 100,000 per year.
- Impose a foreign currency tax on all imported vehicles. US\$ 3,000,000 per year can be levied this way. This amount can be set aside for purchase of approximately 15,000 tons of fuel per year, on a planned and scheduled basis.
- Impose a 100% foreign currency tax on all generator imports and have all generators over 5 KVA registered. Impose a yearly licence fee in Pesos.
- Have all foreigners residing in Guinea-Bissau, whose earnings are in foreign currency, pay their electric and water bills in foreign currency.
- Enter into negotiations with the private sector, local as well as international, for construction and operation of additional depots and service stations.

It is recommended that a value added tax on fuel usage be imposed on foreign vessels. Total fuel consumption is estimated at 70,000 tons per year, which, at 50 to 100 US\$/ton should bring between 3.5 and 7 million US dollars of revenue per year.

## 6. ALTERNATE FUELS/ENERGY SOURCES

### 6.1 Fuel Oil

The option to switch to fuel-oil should be considered if and when:

- DICOL's facilities are rehabilitated.
- EAGB is in a position to satisfy the estimated demand.
- Saltinho power plant construction is postponed beyond 1995.

If all these conditions are satisfied, then this option should be exercised around 1995. Per today's value of the dollar the cost of reconversion will be approximately US\$ 2,500,000. The investment costs will be offset within five years.

### 6.2 Hydroelectric Power

- To ease the burden of fuel imports, it is recommended that a hydroelectric power plant near Saltinho be built. Approximate costs are US\$ 60,000,000.
- It is recommended that the study on pooling hydroelectric power of several western countries, including Guinea-Bissau, be completed. The approximate costs are 3 million French Francs.

### 6.3 Residues from Sugar Cane and Rice

US AID, who has been involved in several projects to generate power from sugar cane and rice residues, should be contacted to assist in developing prototypes and possibly production of equipment for this type of turbines.

### 6.4 Charcoal Stoves

- Better coal burning stoves ought to be introduced in the country.
- Better coal-making techniques ought to be introduced in the country.

### 6.5 Exploration for Hydrocarbons

Guinea-Bissau, per previous reports, has a hydrocarbon potential. In 1989 another well will be drilled in its waters. A planned promotional campaign should be conducted with:

- Internationally targeted audiences;
- Advertising campaign;
- Seminar schedules and locations;
- Promotional documentation.

The costs associated with this campaign will be around US\$ 150,000.

## 7. FINANCIAL REVIEW

Both DICOL and GUINEGAZ can be considered bankrupt. There is no sense in injecting money into both companies until the companies are either sold to provide concerns on their managements is combined and given to an outside firm and until their financial viability can be assured by:

- Bad debts written off;
- Strict credit control;
- Interest charges set at realistic rates;
- Prices set at economic levels based on parallel exchange rates;
- Hard currency account established;
- Purchase of large shipment to minimize transport costs.

## 8. PURCHASING AND PRICING POLICY

GUINEGAZ and DICOL are not in reality independent companies. Neither has financial independence. Tanker loads are purchased only with Government approval. As the Government has extreme hard currency problems, the purchases of fuels are delayed resulting in shortages at the pump.

### 8.1. Transport Costs

- The largest tanker which can dock at the DICOL jetty is 10,000 tons equivalent to about \$20/ton transport cost. 1988 sea shipments averaged only 3,545 tons at a higher unit transport cost of \$50/ton. Road haulage was naturally even more expensive at \$190/ton. The

unnecessary additional cost to DICOL of poorly organized transport in 1988 amounted to US\$ 638,100 (by sea) and US\$ 69,400 (by road). Had this been avoided, it would have increased the operating profit from a weak 3% to a healthy 15% on turnover.

- Some doubts were expressed that the entry channel to Bissau would only accommodate 6000 ton ships under normal tidal conditions. If this is the case, dredging may be economic. Whatever the channel/jetty limitations however the maximum possible loads should be ordered.
- The transportation of butane is also very expensive at about US\$ 250/ton for the normal 600 ton purchase. As these shipments are at the limit of the existing storage capacity, no reduction in transport costs can be suggested.

## 8.2 Economic Costing

- The book keeping at DICOL is well done in strictly accountancy terms. It is not dynamic enough for the financial situation in Guinea-Bissau in that it does not take adequate account of the parallel exchange rate, inflation and the bad debt.
- Management information at GUINEGAZ does not exist.

### 1) Exchange rate

By using the official rate of exchange in its price determination, DICOL equates costs in dollars (for the purchase of fuel) with revenue in pesos. The accounts in 1987 showed a profit on turnover of 3%. In reality there is a real loss of 14% on turnover. In future DICOL should do all its economic calculations using the parallel exchange rate.

### 2) Inflation

As an example of the effects of inflation take 1987 when the peso devalued 267% i.e. 24 1/4% per month. Any client delaying payment for 91 days - quite a normal business delay - would save over half his bill by paying in "old" i.e. 91 days Pesos. Average payment delays were much greater - 292 days.

In 1987 inflation was estimated to have cost DICOL 3.4% of turnover.

Charging 1% per month interest on overdue payments does not take sufficient notice of the rampant inflation to which the country has been subjected. The interest rate should be tied to the inflation rate and updated monthly.

### 3) Bad Debt

In 1987 DICOL accounts showed a book profit. The accounts refer to the 10 years of the company's existence and the cumulative loss which was finally cleared in that year's accounts. In fact the company is making an enormous loss and the cumulative loss is increasing. The company is bankrupt in economic terms.



Parastatal companies make up 44% of sales but 67% of the debtors. At the end of 1987 DICOL was owed US\$ 3.7 million which exceeded its turnover by 13%. Long-term debt was noted at 20% of turnover. The electrical company is DICOL's largest customer (with 30% of sales) and also its largest debtor owing 50% of the total. The company has not paid for any of its purchases for the last few years.

The accounting system used only permits debts to be written off at a maximum 5% per year. To balance the ledgers, the horrendous debt is carried as an asset - and an asset which is growing annually.

As of 1st January 1989, the electric company was to commence paying for current purchases. No attempt was to be made to pay off the old debts.

All of DICOL's bad debt should be written off by the Government. The company should be given complete control of the supply or non supply of indebted customers. A policy should be initiated to stop sales one month after non-payment of accounts. New debts should be written off after 1 year.

### 8.3 Pricing Policy

Neither DICOL nor GUINEGAZ control their prices. Butane and the product drums are knowingly sold at a loss. DICOL estimated a book loss of 2% on a sale price of 8,500 pesos/drum. The butane is purchased at around \$500/ton and sold at about 715 peso/kilogram, i.e. the company is making a 26% loss on the purchase price without even costing overheads.

The Government should consider further increasing prices of all products to an economic level. This will result also in stopping the movement of fuel to Dakar illegally.

SUMMARY OF COSTS

	<u>US\$</u> (in 1,000)	<u>Pesos</u> (in 1,000)
1.1 Additional storage at DICOL	400	-
1.2 Additional service stations	400	-
1.3 Regional depot	600	-
1.4 GUINEGAZ cylinders	700	-
GUINEGAZ transport fleet	50	-
2.2 Unloading/loading piping DICOL	40	-
2.3 Storage tanks revamping	100	-
2.4 Loading systems DICOL	200	-
2.5 Skimmer/slop system	50	-
2.6 Water/fire-fighting DICOL	175	-
2.7 Airport depot	350	-
2.10 "Loss" prevention equipment	300	-
2.11 Electrical facilities DICOL	420	-
2.12 Unloading system GUINEGAZ	40	-
2.13 Bottling facilities GUINEGAZ	15	-
2.14 Water/fire-fighting GUINEGAZ	35	-
3.2 Maintenance facilities	40	-
<b>TOTAL</b>	<b>3,915</b>	-
<b>Construction Costs</b>	<b>929</b>	<b>1,393,500</b> 1/
1.3 Barge for transport	1,500	-
2.1 Engineering contractor	650	-
2.9 Safety engineer	200	-
2.10 Loss prevention officer	-	500
3.1 Organization development	600	-
4.0 Training	327	37,500
6.2 Hydroelectric power study	500	-
6.5 Exploration promotion	150	-
<b>TOTAL 2</b>	<b>3,927</b>	<b>38,000</b>
<b>Totals 1 + 2 + Constr. Costs.</b>	<b>8,771</b>	<b>1,431,500</b>

1/ 1 US dollar = 1,500 Pesos

REVENUES PER YEAR FROM TAXES

	<u>US\$</u> (in 1,000)	<u>Pesos</u> (in 1,000)
5. Tax on imported vehicles	3,900	-
Tax on imported fuel by private concerns	100	-
Tax on imported generators	50	-
Tax on foreign vessels	3,500	-
<b>TOTAL</b>	<u>6,650</u>	<u>-</u>