

**BEST AVAILABLE DOCUMENT**

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COUNTRY PROFILES

PHYSICAL INFRASTRUCTURE

COUNTRY ENERGY DATA

## GUATEMALA

Guatemala with a population of 7.2 million (1981 est.), the largest in Central America, has a geographic area of 42,042 sq. miles (67,267 sq.kms.), the size of Tennessee. The central highland and mountain areas are bordered by the narrow Pacific coast and the lowlands - fertile valleys on the Caribbean. There are numerous volcanoes in the South, more than a half a dozen over 11,000 ft.

### Transportation

Roads: Guatemala has 26,429 kms of roads, of which 2,851 are paved and 11,438 are gravel or crushed stone. There are 12,140 kms included in the category of unimproved earth roads. Guatemala has a good transport network in the southern-central area, but other regions, in the past, have been neglected. Plans for the Transversal de Norte, a 200 km road running across the northern provinces, should help redress this imbalance and boost development of outlying areas. However, there are still areas in the Highlands region which lack adequate primary and feeder roads. This area is the center for high concentrations of native Indian populations who have been neglected throughout history. Due to the minimal access to resources and markets, these groups have remained in the clutches of subsistence living. Roads along with integrated input of complementary activities can positively affect the current situation. The present Government has placed a high priority on focussing development activities in this areas. The US A.I.D. and other donors have designed and begun implementing projects along these lines. One concentration point is road construction and maintenance. However, much work remains in this sector so that the local population can enter a development phase and be integrated into the Guatemalan economy and society.

Railroads: The railroad system, 909 kms., connects the seaboards with the capital; there are branch lines north and south to the borders.

Seaports: The chief ports are Puerto Barrios and Santo Tomas de Castilla on the Gulf, and San Jose and Champerro on the Pacific. The Pacific ports are considered inadequate and plans have recently been reactivated for the construction of a new port at Champerro. Three minor ports stand along the coasts. There are 260 kms of navigable inland waterways year round and 730 kms during the high-water season.

Air: The state-owned airline, Aerolineas de Guatemala, has a monopoly of scheduled domestic air transport; other airlines handle international traffic. Guatemala has 532 airfields, of which 527 are usable and 10 have permanent surfaces; 2 fields have lengths between 2440-3659m and 17 have lengths between 1220-2439m. The main airport, a modern international line, is La Aurora at Guatemala City. Guatemala has 14 civil transport aircraft.

## Telecommunications

Modern telecommunication facilities are limited to Guatemala City, although current activities in the rural electrification sector will assist in addressing this gap. There are 82,000 (1.2 per 100 ppl) telephones in use. There are 117 radio(AM & FM) and 25 television stations in the country. 1978 data shows 280,000 radios and 150,000 televisions were in use. Guatemala does have a connection into the Central American microwave net and 1 Atlantic Ocean Satellite station.

## EL SALVADOR

El Salvador with a population of 5 million (1981 est.) has a geographic area of 8,124 sq. miles (13,143 sq. kms.), about the size of Massachusetts. A hot Pacific coastal plain in the south rises to a cooler plateau and valley region, which is densely populated. The north is mountainous, including several volcanoes.

### Transportation

Roads: El Salvador has 10,000 kms of roads, of which 1,500 kms are paved and 4,100 kms are gravel or crushed stone. There are 4,400 kms included in the categories of improved and unimproved earth roads. Overall, these roads are believed to be some of the best on the isthmus. Considerable investments have been made to expand and improve the country's roads, both in rural areas and in and around the main cities.

Prior to the outbreak of hostilities, the existing road system serviced the rural areas fairly well. There were pockets of rural populations which lacked quality roads to market and receive goods and services. However, the problem of access for all members of this society has risen dramatically, especially in the eastern zones. This is due mainly to guerilla activities. The guerillas have increasingly concentrated on economic terrorism; that is, they target bridges as means for applying pressure on the government. A recent cable indicates that at least 60 primary and secondary bridges have been damaged or destroyed in recent years. The consequences of these actions has severely disrupted the flow of goods and services from all parts of the country. Furthermore, these actions have created isolation problems for certain areas, which could have further political effects. The US A.I.D. and other development institutions are assisting in the reconstruction of the affected bridges.

Railroads: The railway system, 602 kms, links the seaports of Acajutla and La Union with the capital, San Salvador. The system also has been targets of guerilla activities, therefore traffic has declined dramatically. There exists considerable difficulty in rehabilitating the system at the present time.

Seaports: Acajutla, which is of international quality, and La Union, which is in poor condition and under consideration for abandonment, stand on the Pacific Coast. A new fishing port of Punta Gorda may replace La Union. The Guatemalan port at Puerto Barrios is used for gulf shipping. The Lempa River is partially navigable as an in-land waterway.

Air: Adequate international passenger and cargo services operate in El Salvador. Internal air travel is not well developed primarily due to the country's size. El Salvador has 158 airfields, of which 146 are usable and 5 have permanent surfaces; one field has a length between 2,440-3,659m and 8 have lengths between 1,220-2,439m. The main airport at Ilopango near San Salvador has been superceded by the new Cuscutlan terminal about 45 kms from the capital. El Salvador has 5 civil transport aircraft.

#### Telecommunications

El Salvador has average telephone service relative to the region. Data indicates that there are 70,000 (1.5 per 100 ppl.) telephones in use. However, clients face occasional disruptions in service due to guerrilla attacks on electrical and telephone installations. There are 69 radio (AM & FM) and 5 television stations in the country. 1977 data shows that 1.4 million radios and 148,000 televisions were in use. El Salvador does have a nationwide trunk radio-relay system and the country connects into the Central American microwave net. El Salvador has one Atlantic Ocean Satellite station.

## HONDURAS

Honduras with a population of 3.9 million (1981 est.) has a geographic area of 43,277 sq. miles (69,243 sq. kms.), slightly larger than Tennessee. The Caribbean coast is 800 kms. long. The Pacific coast on the Gulf of Fonseca is 64 kms. long. Honduras is mountainous, with wide fertile valleys and rich forests.

### Transportation

Honduras has 8950 kms. of roads, of which 1700 kms. are paved. There are 5,000 kms. of improved earth roads and 2250 kms. in the category of unimproved roads. Over the past twenty years the Honduran Government has carried out an extensive road building program throughout the country, with almost all principal highway work being carried out in the western half. The majority of roads, including even the primary and secondary routes, are considered deficient with respect to width, alignment, surfacing and drainage. There has been a greater emphasis on construction of paved roads and maintenance of paved roads. The emphasis on primary road construction has meant that the majority of people in rural areas remain largely isolated from the rest of the country, since they do not live on or even near any primary routes. The Government of Honduras and contributing donor agencies recognize the need to provide improved access to isolated rural communities. Increased emphasis in access roads will enable the extension of basic educational, health, agricultural and other social services to rural areas. Access roads link valleys and zones of high production potential with principal roads. Construction provides supplementary employment for the rural poor. Nonetheless, there remains a significant gap in the overall outreach of roads and trails. This problem acts as a constraint to development.

Railroads: The railway system is 751 kms. There are no rail connections with other Central American countries.

Seaports: The four main ports on the Caribbean are Puerto Cortes, which handles over half the export trade, La Ceiba, Tela and Puerto Castilla; on the Pacific Coast most goods are shipped through San Lorenzo (recently completed) and the small port of Amapala. Plans are in hand for the further development of Puerto Castilla to serve the Olancho forestry, paper and pulp complex. Shipping services are considered excellent in Honduras. The country has 1200 kms. of inland waterways navigable by small craft.

Air: Air transport is fairly well developed. Honduras has 217 airfields, of which 213 are usable and 5 have permanent services; two fields have lengths between 2440-3659 m. and 6 have lengths between 1220-2439 m. Both Tegucigalpa and San Pedro have international airports. Honduras has 14 civil transport aircraft.

### Telecommunications

Telecommunications in Honduras has been improved in recent years, but remains inadequate. The data indicates that there are 27,000 (0.7 per 100 pp!) telephones in use; the worst ratio on the isthmus. There are 116 radio (AM & FM) and 7 television stations. In 1977, there were 163,000 radio and 48,000 television sets in use. Honduras does connect into the Central American microwave net.

## COSTA RICA

Costa Rica, with a population of 2.3 million (1981 est.) has a geographic area of 19,653 sq. miles (31,445 sq. kms.) smaller than W. Virginia. The eastern or Caribbean Coast contains the lowlands which has a tropical climate. The mountainous or plateau area stretches from the Southern border (Panama) through the central region and up to the Northwest area bordering Nicaragua. The plateau has a temperate climate.

### Transportation

Roads: The latest available documents indicate that Costa Rica has 28,235 kms. of roads, of which 2435 kms. are paved and 9360 kms. are gravel or crushed stone. However, 16,450 kms. are in the category of unimproved earth. The lack of all-weather roads presents a problems for the Costa Rican economy. The majority of unimproved roads exist in the rural areas, far from the medium-and major-sized cities. These roads provide the vital link for farmers as they bring their goods to market. Also, these roads are vital for the rural population in terms of receiving goods and services from the towns and cities. (Many times, weather conditions prevent the usage of the roads for long periods of time.) The poor quality and durability of the roads act as a constraint upon economic development in these areas. One key region which exhibits these qualities is the Northern Zone Region. This zone has a high agricultural productivity potential, but is mainly used for pasture area to graze cattle. The reason is that the roads are virtually impassable during the long rainy season. The costs are too high to transport crops; therefore, there is no incentive to produce; the cows, on the other hand, can walk to the markets. The major development institutions including A.I.D. are now focusing resources in this zone in order to ameliorate these problems; however, the zone remains a potential problem area.

Railroads: The railway systems, 790 kms., link San Jose with Limon, an Atlantic Port, and Puntarenas, a Pacific port. There are plans to connect the two ports so as to provide a cross-country service. This service could take some of the freight now being carried through the Panama Canal.

Seaports: New facilities are being installed at the Limon port. A new port is being built on the Pacific Coast at Caldera. Currently, there exists another major Pacific port at Golfito and a few minor Atlantic ports. Costa Rica has 730 kms. of perennial navigable in-land waterways.

Air: Several domestic and international airlines serve Costa Rica. The country has 217 airfields, of which 216 are usable and 4 have permanent surfaces; one field has a length between 2440-3659 m. and 9 have lengths between 1220-2439 m. The main airport is at El Coco, near San Jose. Costa Rica has 14 civil transport aircraft.

#### Telecommunications

Costa Rica has one of the best domestic telephone services in the region. Published data indicate there are 185,000 (8.0 per 100 ppl) telephones in use. There are 65 radio (AM & FM) and 15 television stations in the country. In 1977, there were 400,000 radios and 160,000 televisions in use. Costa Rica does connect into the Central American microwave net.

## NICARAGUA

Nicaragua with a population of 2.4 million (1981 est.) has a geographic area of 79,759 sq. miles (124,415 sq. kms.), slightly larger than Wisconsin. Both Atlantic and Pacific coasts are over 320 kms. long. The Cordillera Mountains, with many volcanic peaks, run northwest to southeast through the middle of the country. Nicaragua contains two large lakes, Managua and Nicaragua, near the West Coast.

### Transportation

Nicaragua has 24,126 kms. of roads, of which 1654 kms. are paved and 2711 kms. are gravel or crushed stone. There are 5427 kms. and 14,384 kms. in the categories of improved and unimproved earth roads, respectively. The road network suffered great damage during the Civil War, especially paved thoroughfares in the urban areas and bridges and secondary roads in the rural areas. The present government embarked on a food for work program to rehabilitate roads and to provide employment for the rural poor after the war. Most of the better roads serve the more heavily populated west coast. There was not much current data available on whether the Sandinistas have instituted new road construction projects to address access problems in the South, East, and Northern zones. However, due to the current military tensions, it is probable that the government has strengthened roads systems to the northern and southern borders.

Railroads: The country railway system, 344 kms. consists mainly of the government owned Ferrocarril de Pacifico.

Seaports: Nicaragua has one major port at Corinto on the Pacific Coast. There are 7 minor ports scattered along both coasts. The country has 2200 kms. of navigable inland waterways, including the two large lakes.

Air: Nicaragua has average international air service. There are 349 airfields, of which 326 are usable and 9 have permanent surfaces; 11 fields have lengths between 1220 - 2439 m. The country has 7 civil transport aircraft.

### Telecommunications

The telecommunications network along with the electrical system suffered the greatest damage as an outcome of the war. The Sandinistas inherited this faulty infrastructure; these systems were prime guerrilla targets during the economic disruption phase of the anti-Somoza activities. With little capital from which to draw, rehabilitation of the entire network has been slow. There are 55,800 (2.2 per 100 ppl) telephones in use. The country has 115 radio (AM & FM) and 6 television stations. 1979 figures indicated that there were 600,000 radios and 170,000 televisions in use. The low-capacity radio-relay and wire system is in the process of being replaced. Nicaragua does have a connection into the Central American microwave net and one Atlantic Ocean INTELSET station.

## PANAMA

Panama, with a population of 2 million, has a geographic area of 29,762 sq. miles (47,619 sq. kms.), slightly larger than West Virginia. Two mountain ranges run the length of the isthmus. Tropical rain forests cover the Caribbean coast and eastern Panama. Of course, the Panama Canal dissects the center of the country.

### Transportation

Panama has 8400 kms. of roads, of which 2715 kms. are paved and 3170 kms. are gravel or crushed stone. There are 2515 kms. included in the categories of improved and unimproved earth roads. The Government of Panama has carried out an extensive program of constructing a network of primary and secondary roads in the most populous sections of the country. The road network has effectively linked most of the major urban centers but a gap exists. As the network was constructed, tertiary roads running to small rural communities located off the main roads were not built. Each community was left to its own devices in building connecting links. The results usually were trails created by foot and horse cart. These roads are extremely precarious and usage is subject to the weather conditions. The consequences have been that small farmers' produce is spoiled and transportation costs are high. Also, local farmers have reduced cultivation to the point where incomes remain extremely low. The GOP, the U.S.A.I.D. and other international lenders recently have focused resources on this problem in order to create all-weather roads to spur development. However, most efforts have concentrated on areas with top-class soil potentials. There is a need to address other zones with sufficient rural poor populations who rely on agricultural and other services.

Railroads: The only Panama owned railroad is 192 kms. in length; the fruit companies own several stretches of line.

Seaports: The country has two major ports, Colon along the Atlantic Coast of the Panama Canal and Panama City (Balboa) along the Pacific Coast of the Canal. There are ten minor ports scattered along both coasts. Panama has nominally one of the world's ten largest (37.1 million tons in 1980) shipping fleets, but almost all are foreign owned. There are 800 kms. of inland waterways navigable by shall draft vessels and 82 kms. through the Canal.

Air: Domestic and international airlines serve the country. There are 151 airfields, of which 150 are usable and 39 have permanent surfaces. Two fields have lengths between 2440-3659 m. and 16 have lengths between 1220-2439 m. The main airport is at Tocumen near Panama City; an entirely new airport has been built at Tocumen to accommodate jumbo jets and supersonic aircraft. Panama has 16 civil transport aircraft.

### Telecommunications

The country has a well developed domestic and international telecommunications network. There are 177,000 (8.9 per 100 ppl.) telephones in use. Panama has 120 radios (AM & FM) and 13 television stations. In 1979, there were 285,000 radios and 220,000 televisions in use. The country does have a connection into the Central American Microwave net, 1 Atlantic Ocean satellite ground station, and 1 coaxial submarine cable.

## BELIZE

Belize with a population of 146,000 (1981 est.) has a geographic area of 8,867 sq. miles (14.187 sq. kms).

### Transportation

Belize has 2575 kms. of roads, of which 340 kms. are paved and 1190 kms are gravel or crushed stone. There are 735 kms. in the improved earth road and 310 kms. in the unimproved earth road categories. The primary roads to the North and West of Belize City are paved. The primary road leading to near the southern border is gravel. Two major problems face the Government of Belize in terms of quality and quantity. First, the Government does not have the current capability to maintain the present road system, especially the highly maintenance intensive gravel road to the south. Second, none of the main road systems include good feeder or access roads to the rural communities. The majority of rural poor encounter many difficulties in reaching the primary roads; this problem acts as a disincentive to development. The few feeder roads that do exist are not well maintained. A complementary question has arisen over effective land usage near the current road system, i.e. are the local populations making adequate usage of the land, even with relatively sufficient access? Current U.S.A.I.D. and international donor efforts are addressing the maintenance issues and studying the unique relationship of land usage and road access in Belize.

Railroads: There are no railroads currently in the country.

Seaports: Belize City is the main port; there are four minor ports along the coast. The entire coast is navigable. There was no mention of navigable inland waterways.

Air: Domestic and international air services operate in the country. There are 37 airfields, of which 28 are usable and 4 have permanent surfaces; one strip has a length between 1220-2439 m. The main airport is at Stanley Field, 16 kms. northwest of Belize City. The country has one civil transport aircraft.

### Telecommunications

An automatic telephone service operates in Belize City and other principal towns. There are 5,800 (3.9 per 100 ppl.) telephones in use. The country has 7 radio stations. No data was available on the number of radio and television receivers in the country. Belize does have a radio-relay system and 1 Atlantic Ocean INTELSAT station.

## III. ANALYSIS OF RESULTS

## BEST AVAILABLE DOCUMENT

## 1. Supply Sector

## 1.1. Primary Energy Supply

SOURCE	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
PETROLEUM	309	25.3	399	33.0	404	32.8
. Production	—	—	—	—	—	—
. Imp. (Exp.)	309	25.3	399	33.0	404	32.8
FIREWOOD	474	38.9	475	39.3	458	37.2
. Production	474	38.9	475	39.3	458	37.2
. Imp. (Exp.)	—	—	—	—	—	—
HYDROENERGY	332	27.2	255	18.6	229	18.6
. Production	332	27.2	255	18.6	229	18.6
. Imp. (Exp.)	—	—	—	—	—	—
OTHER PLANT, ANIMAL FUELS	105	8.6	109	9.0	139	11.3
. Production	105	8.6	109	9.0	139	11.3
. Imp. (Exp.)	—	—	—	—	—	—
TOTAL	1,220	100.0	1,208	100.0	1,230	100.0
. National Production	911	74.7	809	67.0	826	67.2
. Imp. (Exp.)	309	25.3	399	33.0	404	32.8

## 1.2. Secondary Energy Supply

SOURCE	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
DIESEL & GAS OIL	164	35.	229	35.5	363	38.3
. Refining	118	25.2	182	28.2	86	9.1
. Imp. (Exp.)	46	9.8	47	7.3	277	29.3
HEAVY FUELS	81	17.3	115	17.8	171	18.1
. Refining	97	20.7	115	17.8	171	18.1
. Imp. (Exp.)	(16)	(3.4)	—	—	—	—
ELECTRICITY	88	18.8	126	19.5	172	18.2
. Generation	88	18.8	126	19.5	172	18.2
. Imp. (Exp.)	—	—	—	—	—	—
GASOLINES & NAPHTHAS	93	19.8	125	19.4	154	16.3
. Refining	61	13.	74	11.5	74	7.8
. Imp. (Exp.)	32	6.8	51	7.9	80	8.4
OTHERS	43	9.2	50	7.8	87	9.2
. Refining	25	5.3	27	4.2	71	7.5
. Imp. (Exp.)	18	3.8	23	3.6	16	1.7
TOTAL	469	100.0	654	100.0	947	100.0
. National Production	389	82.9	524	81.2	574	60.6
. Imp. (Exp.)	80	17.1	121	18.8	373	39.4

## 2. Consumption Sector

## 2.1. Final Energy Consumption by Sectors

SECTOR	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES.,COM., & PUBLIC.	505	52.5	528	47.4	555	39.4
TRANSPORTATION	227	23.6	310	27.8	463	32.9
INDUSTRIAL - AGRICULTURAL	228	23.7	275	24.7	385	27.4
OTHERS	2	0.2	2	0.2	4	0.3
TOTAL	962	100.0	1,115	100.0	1,407	100.0

## 2.2. Consumption Structure by Sectors

SECTOR	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES.,COM., & PUBLIC.		100.0		100.0		100.0
. Firewood	423	83.8	420	79.5	416	75.0
. Electricity	51	10.1	72	13.6	89	16.0
. Kerosene & Turbo Fuels	19	3.8	19	3.6	20	3.6
. Others	12	2.4	17	3.2	30	5.4
TRANSPORTATION		100.0		100.0		100.0
. Diesel & Gas Oil	121	53.3	171	55.2	286	61.8
. Gasolines & Naphthas	98	43.2	128	41.3	154	33.3
. Kerosene & Turbo Fuels	7	3.1	10	3.2	22	4.8
. Electricity	1	0.4	1	0.3	1	0.2
INDUSTRIAL - AGRICULTURAL		100.0		100.0		100.0
. Other Plant, Animal Fuels	102	44.7	107	38.9	136	35.3
. Heavy Fuels	57	25.0	73	26.5	124	32.2
. Firewood	31	13.6	35	12.7	19	4.9
. Others	38	16.7	60	21.8	106	27.5
OTHERS		100.0		100.0		100.0
. Electricity	2	100.0	2	100.0	4	100.0

EL SALVADOR

III. ANALYSIS OF RESULTS

BEST AVAILABLE DOCUMENT

1. Supply Sector

1.1. Primary Energy Supply

SOURCE	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
PETROLEUM	220	14.6	605	29.4	699	24.7
. Production	—	—	—	—	—	—
. Imp. (Exp.)	220	14.6	605	29.4	699	24.7
FIREWOOD	1,096	72.6	1,215	59.0	1,401	49.5
. Production	1,096	72.6	1,215	59.0	1,401	49.5
. Imp. (Exp.)	—	—	—	—	—	—
HYDROENERGY	98	6.5	79	3.8	128	4.5
. Production	98	6.5	79	3.8	128	4.5
. Imp. (Exp.)	—	—	—	—	—	—
OTHER PLANT, ANIMAL FUELS	96	6.4	160	7.8	195	6.9
. Production	96	6.4	160	7.8	195	6.9
. Imp. (Exp.)	—	—	—	—	—	—
GEOENERGY	—	—	—	—	407	14.4
. Production	—	—	—	—	407	14.4
. Imp. (Exp.)	—	—	—	—	—	—
TOTAL	1,510	100.0	2,059	100.0	2,830	100.0
. National Production	1,290	85.4	1,454	70.6	2,131	75.3
. Imp. (Exp.)	220	14.6	605	29.4	699	24.7

1.2. Secondary Energy Supply

SOURCE	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
HEAVY FUELS	144	31.0	239	35.3	162	19.8
. Refining	60	12.9	239	35.3	194	23.7
. Imp. (Exp.)	84	18.1	—	—	(32)	(3.9)
ELECTRICITY	57	12.3	85	12.5	137	16.7
. Generation	57	12.3	85	12.5	137	16.7
. Imp. (Exp.)	—	—	—	—	—	—
DIESEL & GAS OIL	120	25.8	166	24.5	249	30.4
. Refining	44	9.5	166	24.5	239	29.2
. Imp. (Exp.)	76	16.3	—	—	10	1.2
GASOLINES & NAPHTHAS	98	21.1	114	16.8	167	20.4
. Refining	38	8.2	108	15.9	161	19.7
. Imp. (Exp.)	60	12.9	6	0.9	6	0.7
OTHERS	46	9.9	74	10.9	103	12.6
. Ref. Char. Gas Plants	33	7.1	75	11.1	99	12.1
. Imp. (Exp.)	13	2.8	(1)	(0.1)	4	0.5
TOTAL	465	100.0	678	100.0	818	100.0
. National Production	232	49.9	673	99.3	830	101.5
. Imp. (Exp.)	263	50.1	5	0.7	(12)	(1.5)

## BEST AVAILABLE DOCUMENT

## 2. Consumption Sector

## 2.1. Final Energy Consumption by Sectors

SECTOR	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES., COM., & PUBLIC	1,134	73.2	1,166	66.1	1,489	64.3
TRANSPORTATION	184	11.9	241	13.7	378	16.4
INDUSTRIAL	196	12.6	313	17.7	402	17.4
OTHERS	36	2.3	45	2.5	38	1.6
TOTAL	1,550	100.0	1,765	100.0	2,307	100.0

## 2.2. Consumption Structure by Sectors

SECTOR	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES., COM., & PUBLIC		100.0		100.0		100.0
. Firewood.	1,055	93.0	1,184	93.5	1,368	91.9
. Kerosene & Turbo Fuels	35	3.1	25	2.0	26	1.7
. Electricity	28	2.5	39	3.1	63	4.2
. Others	16	1.4	18	1.4	32	2.1
TRANSPORTATION		100.0		100.0		100.0
. Gasolines & Naphthas	96	52.2	115	47.7	163	43.1
. Diesel & Gas Oil	72	39.1	108	44.8	188	49.7
. Kerosene & Turbo Fuels	11	6	14	5.8	24	6.3
. Heavy Fuels	5	2.7	4	1.7	3	0.8
INDUSTRIAL		100.0		100.0		100.0
. Other Plant, Animal Fuels	72	36.7	133	42.5	162	40.3
. Heavy Fuels	56	28.6	97	31.0	139	34.6
. Firewood	33	16.8	27	8.6	30	7.5
. Others	35	17.9	56	17.9	71	17.7
OTHERS						
. Diesel & Gas Oil	26	72.2	32	71.1	28	73.7
. Heavy Fuels	6	16.7	7	13.3	7	18.4
. Gasolines & Naphthas	3	8.3	3	6.7	3	7.9
. Kerosene & Turbo Fuels	1	2.8	4	8.9	-	

## III. ANALYSIS OF RESULTS

## BEST AVAILABLE DOCUMENT

## 1. Supply Sector

## 1.1. Primary Energy Supply

SOURCE	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
PETROLEUM	764	30.7	963	33.0	875	28.7
. Production	—	—	—	—	79	2.6
. Imp. (Exp.)	764	30.7	963	33.0	796	26.1
FIREWOOD	1,602	64.4	1,738	59.5	1,926	63.2
. Production	1,602	64.4	1,738	59.5	1,926	63.2
. Imp. (Exp.)	—	—	—	—	—	—
OTHER PLANT, ANIMAL FUELS	96	3.9	191	6.5	217	7.1
. Production	96	3.9	191	6.5	217	7.1
. Imp. (Exp.)	—	—	—	—	—	—
HYDROENERGY	26	1.0	27	0.9	23	0.8
. Production	26	1.0	27	0.9	23	0.8
. Imp. (Exp.)	—	—	—	—	—	—
ASSOCIATED GAS	—	—	—	—	5	0.2
. Production	—	—	—	—	5	0.2
. Imp. (Exp.)	—	—	—	—	—	—
TOTAL	2,488	100.0	2,919	100.0	3,046	100.0
. National Production	1,724	69.3	1,956	66.9	2,250	73.9
. Imp. (Exp.)	764	30.7	963	33.0	796	26.1

## Secondary Energy Supply

SOURCE	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
HEAVY FUELS	211	26.7	296	28.5	468	29.1
. Refining	211	26.7	296	28.5	291	18.1
. Imp. (Exp.)	—	—	—	—	177	11.0
DIESEL & GAS OIL	202	25.6	267	25.7	512	31.9
. Refining	202	25.6	267	25.7	261	16.3
. Imp. (Exp.)	—	—	—	—	251	15.6
GASOLINES & NAPHTHAS	171	21.7	226	21.7	329	20.5
. Refining	171	21.7	226	21.7	140	8.7
. Imp. (Exp.)	—	—	—	—	189	11.8
KEROSENE & TURBO FUELS	96	12.2	103	9.9	115	7.2
. Refining	82	10.4	88	8.5	84	5.2
. Imp. (Exp.)	14	1.8	15	1.4	31	1.9
OTHERS	109	13.8	148	14.2	182	11.3
. Ref., Gen., Gas Plants	97	12.3	124	11.9	137	8.5
. Imp. (Exp.)	12	1.5	24	2.3	45	2.8
TOTAL	789	100.0	1,040	100.0	1,606	100.0
. National Production	763	96.7	1,001	96.3	913	56.8
. Imp. (Exp.)	26	3.3	39	3.8	693	43.2

## 2. Consumption Sector

## BEST AVAILABLE DOCUMENT

SECTOR	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES., COM., & PUBLIC	1,427	61.1	1,562	59.1	1,764	53.3
TRANSPORTATION	328	14	397	15.0	583	17.6
INDUSTRIAL	575	24.6	677	25.6	959	29.0
OTHERS	5	0.2	9	0.3	6	0.2
TOTAL	2,335	100.0	2,645	100.0	3,312	100.0

## 2.2. Consumption Structure by Sectors

SECTOR	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES., COM., & PUBLIC		100.0		100.0		100.0
Firewood	1,326	92.9	1,439	92.1	1,595	90.4
Kerosene & Turbo Fuels	36	2.5	41	2.6	45	2.6
Electricity	24	1.7	33	2.1	54	3.1
Others	41	2.9	49	3.1	70	4.0
TRANSPORTATION		100.0		100.0		100.0
Gasoline & Naphthas	185	56.4	224	56.4	317	54.4
Diesel & Gas Oil	100.0	30.5	124	31.2	206	35.3
Kerosene & Turbo Fuels	40	12.2	46	11.6	50	8.6
Heavy Fuels	3	0.9	3	0.8	10	1.7
INDUSTRIAL		100.0		100.0		100.0
Firewood	276	48.0	299	44.2	331	34.5
Heavy Fuels	140	24.3	136	20.1	237	24.7
Other Plant, Animal Fuels	67	11.7	134	19.8	152	15.8
Others	92	16	108	16	239	24.9
OTHERS		100.0		100.0		100.0
Electricity	5	100.0	9	100.0	6	100.0

## III. ANALYSIS OF RESULTS

## 1. Supply Sector

## 1.1. Primary Energy Supply

SOURCE	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
PETROLEUM	725	42.3	624	36.3	491	28.2
. Production	—		—		—	
. Imp. (Exp.)	725	42.3	624	36.3	491	28.2
FIREWOOD	941	54.9	1,012	58.9	1,107	63.6
. Production	941	54.9	1,012	58.9	1,107	63.6
. Imp. (Exp.)	—		—		—	
OTHER PLANT, ANIMAL FUELS	28	1.6	39	2.3	65	3.7
. Production	28	1.6	39	2.3	65	3.7
. Imp. (Exp.)	—		—		—	
HYDROENERGY	21	1.2	42	2.4	78	4.5
. Production	21	1.2	42	2.4	78	4.5
. Imp. (Exp.)	—		—		—	
TOTAL	1,715	100.0	1,717	100.0	1,741	100.0
. National Production	990	57.7	1,093	63.7	1,250	71.8
. Imp. (Exp.)	725	42.3	624	36.3	491	28.2

## 1.2. Secondary Energy Supply

SOURCE	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
HEAVY FUELS	139	30.0	83	18.4	112	17.3
. Refining	336	72.6	283	62.6	115	17.8
. Imp. (Exp.)	(197)	(42.5)	(200)	(44.2)	(3)	(0.5)
DIESEL & GAS OIL	156	33.7	174	38.5	253	39.1
. Refining	216	46.7	173	38.3	193	29.8
. Imp. (Exp.)	(60)	(13.0)	1	0.2	60	9.3
GASOLINES & NAPHTHAS	85	18.4	93	20.6	110	17.0
. Refining	109	23.5	85	18.8	88	13.6
. Imp. (Exp.)	(24)	(5.2)	8	1.8	22	3.4
KEROSENE & TURBO FUELS	37	8.0	42	9.3	69	10.7
. Refining	37	8.0	42	9.3	61	9.4
. Imp. (Exp.)	—		—		8	1.2
OTHERS	46	9.9	60	13.3	103	15.9
. Ref. Charcoal plants, gen.	46	9.9	60	13.3	96	14.8
. Imp. (Exp.)	—		—		7	1.1
TOTAL	463	100.0	452	100.0	647	100.0
. National Production	744	160.7	643	142.3	553	85.5
. Imp. (Exp.)	(281)	(60.7)	(191)	(42.3)	94	14.5

## 2. Consumption Sector

## 2.1. Final Energy Consumption by Sectors

SECTOR	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES., COM., & PUBLIC	908	69.4	985	69.4	1,122	64.8
TRANSPORTATION	138	10.6	159	11.2	217	12.5
INDUSTRIAL	247	18.9	257	18.1	366	21.1
OTHERS	15	1.1	18	1.3	26	1.5
TOTAL	1,308	100.0	1,419	100.0	1,731	100.0

## 2.2. Consumption Structure by Sectors

SECTOR	1970		1974		1979	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES., COM., & PUBLIC		100.0		100.0		100.0
. Firewood	836	92.1	899	91.3	984	87.7
. Kerosene & Turbo Fuels	30	3.3	32	3.2	43	3.8
. Electricity	11	1.2	15	1.5	30	2.7
. Others	31	3.4	39	4.0	65	5.8
TRANSPORTATION		100.0		100.0		100.0
. Gasoline & Naphthas	74	53.6	78	49.1	93	42.9
. Diesel & Gas Oil	59	42.8	72	45.3	106	48.8
. Kerosene & Turbo Fuels	5	3.6	9	5.7	18	8.3
INDUSTRIAL		100.0		100.0		100.0
. Firewood	89	36.0	95	37.0	104	28.4
. Heavy Fuels	76	30.8	53	20.6	75	20.5
. Diesel & Gas Oil	34	13.8	42	16.3	80	21.9
. Others	48	19.4	67	26.1	107	29.2
OTHERS		100.0		100.0		100.0
. Diesel & Gas Oil	10	66.7	13	72.2	19	73.1
. Electricity	3	20.0	3	16.7	3	11.5
. Gasolines & Naphthas	2	13.3	2	11.1	3	11.5
. Heavy Fuels	—	—	—	—	1	3.8

## III. ANALYSIS OF RESULTS

## BEST AVAILABLE DOCUMENT

## 1. Supply Sector

## 1.1. Primary Energy Supply

SOURCE	1970		1976		1980	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
PETROLEUM	450	33.0	691	46.6	566	41.0
. Production	—	—	—	—	—	—
. Imp. (Exp.)	450	33.0	691	46.6	566	41.0
FIREWOOD	552	40.4	611	41.2	613	44.4
. Production	552	40.4	611	41.2	613	44.4
. Imp. (Exp.)	—	—	—	—	—	—
HYDROENERGY	267	19.6	34	2.3	70	5.1
. Production	267	19.6	34	2.3	70	5.1
. Imp. (Exp.)	—	—	—	—	—	—
OTHER PLANT, ANIMAL FUELS	96	7.0	148	10.0	131	9.5
. Production	96	7.0	148	10.0	131	0.5
. Imp. (Exp.)	—	—	—	—	—	—
T O T A L	1,365	100.0	1,484	100.0	1,380	
. National Production	915	67.0	793	53.4	814	59.0
. Imp. (Exp.)	450	33.0	691	46.6	566	41.0

## 1.2. Secondary Energy Supply

SOURCE	1970		1976		1980	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
HEAVY FUELS	137	26.8	245	30.7	199	28.5
. Refining	137	26.8	229	28.7	156	22.3
. Imp. (Exp.)	—	—	16	2.0	43	6.2
DIESEL & GAS OIL	146	28.6	207	25.9	194	27.8
. Refining	128	25.0	168	21.1	174	24.9
. Imp. (Exp.)	18	3.5	39	4.9	20	2.9
GASOLINES & NAPHTHAS	121	23.7	180	22.6	147	21.1
. Refining	114	22.3	170	21.3	137	19.6
. Imp. (Exp.)	7	1.4	10	1.3	10	1.4
ELECTRICITY	48	9.4	80	10.0	79	11.3
. Generation	48	9.4	79	9.9	80	11.5
. Imp. (Exp.)	—	—	1	0.1	(1)	(0.1)
OTHERS	59	11.5	86	10.8	79	11.3
. Charcoal, Ref.	59	11.5	89	11.2	78	11.2
. Imp. (Exp.)	—	—	(3)	(0.4)	1	0.1
T O T A L	511	100.0	798	100.0	698	100.0
. National Production	486	95.1	735	92.1	625	98.5
. Imp. (Exp.)	25	4.9	63	7.9	73	10.5

## 2. Consumption Sector

## 2.1. Final Energy Consumption by Sectors

SECTOR	1970		1976		1980	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES., COM., & PUBLIC	536.0	54.2	598.0	45.2	654.0	53.4
TRANSPORTATION	155.0	15.7	259.0	19.6	234.0	19.1
INDUSTRIAL	185.0	18.7	278.0	21.0	181.0	14.8
OTHERS	113.0	11.4	189.0	14.3	155.0	12.7
TOTAL	898.0	100.0	1,324.0	100.0	1,224.0	100.0

## 2.2. Consumption Structure by Sectors

SECTOR	1970		1976		1980	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES., COM., & PUBLIC		100.0		100.0		100.0
. Firewood	468.0	87.3	498.0	83.3	518.0	79.2
. Electricity	19.0	3.5	32.0	5.4	39.0	6.0
. Kerosene & Turbo Fuels	14.0	2.6	17.0	2.8	15.0	2.3
. Others	35.0	6.5	51.0	8.5	82.0	12.5
TRANSPORTATION		100.0		100.0		100.0
. Gasoline & Naphthas	91.0	58.7	153.0	59.1	121.0	51.7
. Diesel & Gas Oil	48.0	31.0	78.0	30.1	95.0	40.6
. Kerosene & Turbo Fuels	16.0	10.3	28.0	10.8	18.0	7.7
INDUSTRIAL		100.0		100.0		100.0
. Diesel & Gas Oil	57.0	30.8	90.0	32.4	35.0	19.3
. Firewood	50.0	27.0	76.0	27.3	57.0	31.5
. Heavy Fuels	44.0	23.8	64.0	23.0	53.0	29.3
. Others	34.0	18.4	48.0	17.3	36.0	19.9
OTHERS		100.0		100.0		100.0
. Other Plant, Animal Fuels	86.0	76.1	135.0	71.4	117.0	75.5
. Heavy Fuels	9.0	8.0	17.0	9.0	6.0	3.9
. Diesel & Gas Oil	8.0	7.1	14.0	7.4	18.0	11.6
. Others	10.0	8.8	23.0	12.2	14.0	9.0

III. ANALYSIS OF RESULTS

1. Supply Sector

1.1. Primary Energy Supply

SOURCE	1970		1974		1978	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
CRUDE OIL	3,714.9	91.6	3,589.4	90.5	2,381.8	82.6
. Production	—	—	—	—	—	—
. Imp. (Exp.)	3,714.9	91.6	3,589.4	90.5	2,381.8	82.6
FIREWOOD	282.9	7.0	289.1	7.3	295.3	10.2
. Production	282.9	7.0	289.1	7.3	295.3	10.2
. Imp. (Exp.)	—	—	—	—	—	—
OTHER PLANT, ANIMAL FUELS	45.2	1.1	68.7	1.7	130.2	4.5
. Production	45.2	1.1	68.7	1.7	130.2	4.5
. Imp. (Exp.)	—	—	—	—	—	—
HYDROENERGY	11.7	0.3	13.4	0.3	76.1	2.6
. Production	11.7	0.3	13.4	0.3	76.1	2.6
. Imp. (Exp.)	—	—	—	—	—	—
COAL	0.5	0.0	3.6	0.1	—	—
. Production	—	—	—	—	—	—
. Imp. (Exp.)	0.5	0.0	3.6	0.1	—	—
TOTAL	4,055.2	100.0	3,964.2	100.0	2,883.4	100.0
. National Production	339.8	8.4	371.2	9.4	501.6	17.4
. Imp. (Exp.)	3,715.4	91.6	3,593.0	90.6	2,381.8	82.6

1.2. Secondary Energy Supply

SOURCE	1970		1974		1978	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
HEAVY FUELS	77.2	11.5	461.2	31.2	267.1	25.9
. Refining	1,898.0	282.8	1,967.6	133.0	1,159.6	112.5
. Imp. (Exp.)	(1,820.8)	(271.3)	(1,506.4)	(101.8)	(892.5)	(86.7)
DIESEL & GAS OIL	127.6	19.0	373.8	25.3	259.3	25.2
. Refining	778.4	116.0	721.1	48.7	630.5	61.2
. Imp. (Exp.)	(650.8)	(97.0)	(347.3)	(23.5)	(371.2)	(36.0)
GASOLINES & NAPHTHAS	118.4	17.6	237.1	16.0	245.2	23.8
. Refining	419.9	62.6	420.9	28.4	316.3	30.7
. Imp. (Exp.)	(301.5)	(44.9)	(183.8)	(12.4)	(71.1)	(6.9)
KEROSENE & TURBO FUELS	136.9	20.4	159.4	10.8	13.3	1.3
. Refining	367.6	54.8	262.6	17.7	163.4	15.9
. Imp. (Exp.)	(230.7)	(34.4)	(103.2)	(7.0)	(150.1)	(14.6)
OTHERS	211.0	31.4	248.4	16.8	244.8	23.8
Ref.; Gen.; Gas, Char. P.	216.3	32.2	248.0	16.8	231.7	22.4
. Imp. (Exp.)	(5.3)	(0.8)	0.4	0.0	14.3	1.4
TOTAL	671.1	100.0	1,479.9	100.0	1,030.3	100.0
. National Production	3,680.2	548.4	3,620.2	244.6	2,500.9	242.7
. Imp. (Exp.)	(3,009.1)	(448.4)	(2,140.3)	(144.6)	(1,470.6)	(142.7)

## 2. Consumption Sector

## 2.1. Final Energy Consumption by Sectors

SECTOR	1970		1974		1978	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES., COM., & PUBLIC	354.9	52.8	381.6	40.2	429.8	38.2
TRANSPORTATION	202.9	30.2	334.0	35.2	334.3	29.7
INDUSTRIAL - AGRICULTURAL	113.9	16.9	232.8	24.5	359.8	32.0
OTHERS	0.6	0.1	0.9	0.1	1.3	0.1
TOTAL	672.3	100.0	949.3	100.0	1,125.2	100.0

## 2.2. Consumption Structure by Sectors

SECTOR	1970		1974		1978	
	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o	TOEx10 <sup>3</sup>	o/o
RES., COM., & PUBLIC		100.0		100.0		100.0
. Firewood	270	76.1	278.5	73.1	286.9	66.8
. Electricity	44.3	12.5	60.8	15.9	92.8	21.6
. Liquified Gas	21.1	5.9	31.1	8.1	42.7	9.9
. Others	19.5	5.5	11.2	2.9	7.4	1.7
TRANSPORTATION		100.0		100.0		100.0
. Gasoline & Naphthas	175.9	86.7	235.6	70.5	258.3	77.3
. Diesel & Gas Oil	18.3	9.0	91.5	27.4	72.9	21.8
. Kerosene & Turbo Fuels	8.7	4.3	6.9	2.1	3.1	0.9
INDUSTRIAL - AGRICULTURAL		100.0		100.0		100.0
. Heavy Fuels	14.8	13.0	89.8	38.6	90.7	25.2
. Other Plant, Animal Fuels	37.0	32.5	55.9	24.0	103.3	28.7
. Diesel & Gas Oil	34.1	29.9	51.0	21.9	139.2	38.7
. Others	28.0	24.6	36.1	15.5	26.6	7.4
OTHERS		100.0		100.0		100.0
. Electricity	0.6	100.0	0.9	100.0	1.3	100.0