

Energy Supply and Demand

Like those of most developing countries, the Central American economies are dualistic in nature: the rural sector produces mainly traditional agricultural goods, while the rapidly growing urban sector is involved in more modern industrial and commercial pursuits. This dualistic nature is reflected in the pattern of energy consumption shown in the accompanying graphs. People in rural areas rely mainly on firewood to satisfy their energy needs, while those in the cities rely more on electricity and oil products. Consequently, countries with greater degrees of urbanization and higher per capita incomes use relatively more oil products and electricity and less fuelwood than the poorer countries. In 1983, for example, Panama and Costa Rica, the countries with the highest per capita incomes, relied on fuelwood for one-quarter to one-third of their energy needs, while the lower-income countries, Honduras, El Salvador, and Guatemala, relied on fuelwood for two-thirds to three-quarters of their energy needs.

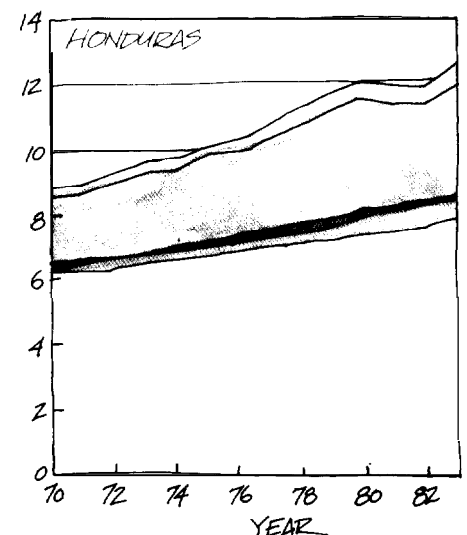
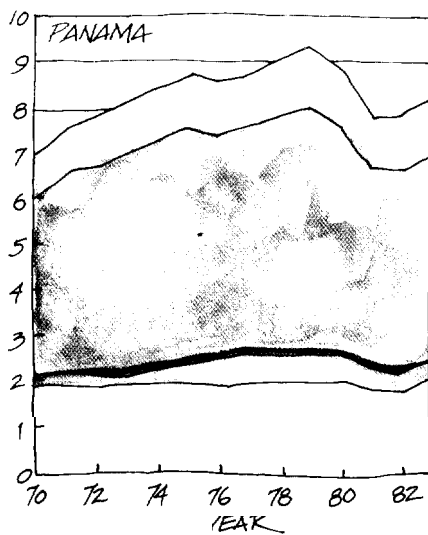
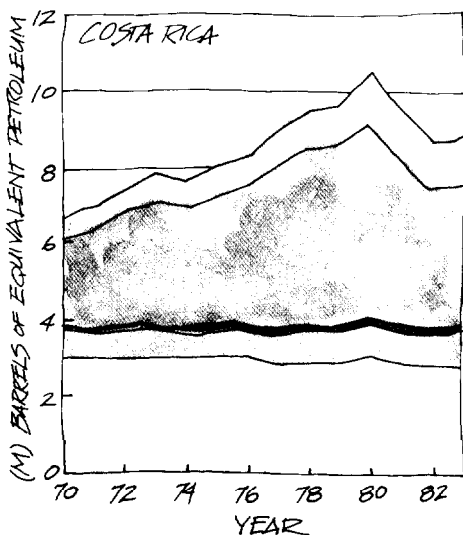
(Data on fuelwood consumption in these and other developing countries are generally poor because much fuelwood does not enter commercial markets where its sale and use can be quantified. The apparent sharp increase in Guatemala's fuelwood consumption in 1979 (see graph) stems from a revision in the estimate of fuelwood consumption rather than a real increase in use.)

In all the Central American countries electricity composes a relatively small share of the total energy consumed, but it has shown the most rapid and variable growth in demand since 1970 (between 1970 and 1980 the demand for electricity grew at an average rate of 9 percent per year).

In the early 1980s Central American countries were hard hit by the worldwide recession. Total energy consumption decreased significantly in Costa Rica, El Salvador, and Panama, and the rate of growth in demand decreased in Guatemala and Honduras. These decreases were absorbed mainly in oil product and elec-

tricity demand. Unlike 1973, when oil price hikes could be balanced by debt-financed growth, the early 1980s were a time when large national debts and high interest rates made additional loans difficult and costly to obtain. To exacerbate the situation, the prices received for the main export commodities (bananas, coffee, and sugar) had dropped so low that foreign currency to pay for oil imports and to service foreign debts was in short supply. On a per capita basis Costa Rica and Panama are among the most indebted countries in the world.

With the exception of Guatemala, which produces 1.6 million barrels of poor-quality crude oil per year, the Central American countries have no proven oil reserves and must pay a burdensome price to import oil for transportation and, to a lesser extent, for industry. They all rely heavily on fuelwood, but this resource is threatened in some countries by growing deforestation due mainly to clearing of land for agricultural purposes. By the year 2000 they will undoubtedly face fuelwood



in Central America

by Linda K. Trocki and Steven R. Booth

shortages unless substitution or conservation takes place or unless policies to increase fuelwood availability, such as tree farms, are implemented. Since fuelwood is generally gathered by individuals at zero or low cost, finding a similarly inexpensive substitute will represent a major challenge to many of the Central American countries.

The Central Americans can reduce the demand for fuelwood and imported oil by further developing their large potential for hydroelectric energy and geothermal energy, as well as alternatives such as solar energy, crop residues, and peat. As is evident from the graphs, crop residues already play a significant role in energy supply in most countries in the region. The residues are burned to provide process heat for the food-processing industries and in some cases to generate electricity. In addition, Costa Rica and El Salvador have begun to produce fuel alcohol from sugar cane.

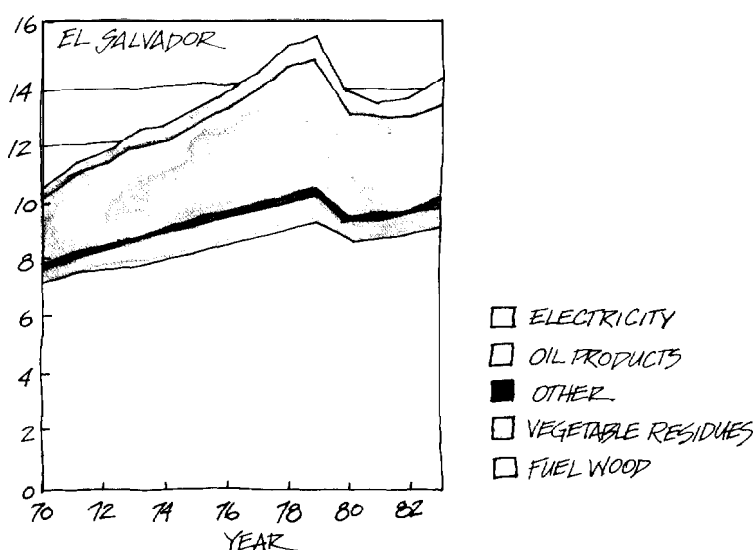
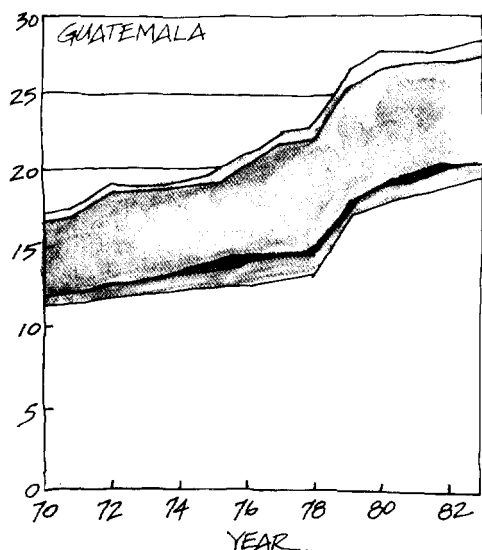
The countries have also lessened their reliance on imported oil by exploiting

their hydroelectric resources to generate electricity. The electric generating capacity in the Central American countries ranges from approximately 500 to almost 900 megawatts, and hydroelectric power constitutes more than 50 to 80 percent of this capacity in all the countries. Since 1979 all countries except El Salvador have greatly increased their electric generating capacity by constructing relatively large (250- to 330-megawatt) hydroelectric power plants. However, the Chixoy hydroelectric plant in Guatemala, commissioned in 1983, was down during much of 1984 and 1985 for repair of a tunnel associated with the dam. As a result, Guatemala incurred a large and unexpected requirement for oil-fired generation to meet its electricity needs. (Chixoy recently resumed operation but not at full capacity.) Construction of the large hydroelectric facilities, while reducing reliance on oil imports, has resulted in temporary overcapacity in Costa Rica and Honduras and significant debts to all the national utilities.

The development of indigenous geo-

thermal energy resources represents an attractive alternative to meet the energy demand. Two countries in Central America already exploit geothermal energy for electricity generation—El Salvador and Nicaragua. (The latter is not included in the Los Alamos study.) By 1990 Costa Rica and Guatemala expect to begin generating electric power from geothermal sites now under development.

In summary, Central America, like most developing regions, relies heavily on two forms of energy—imported oil and fuelwood. Continued heavy reliance on these fuels could result in more serious economic repercussions in the future. For example, every dollar spent to pay the oil-import bill precludes the import of a dollar's worth of capital goods that could further production. And the strong market for fuelwood, which has already caused rapid price increases for that energy source, could lead to serious deforestation problems. Conservation and substitution of indigenous resources could ameliorate potential problems. ■



- ELECTRICITY
- OIL PRODUCTS
- OTHER
- VEGETABLE RESIDUES
- FUEL WOOD