

**Commission of the European Communities  
Directorate General for Development**

**Europe,  
the developing countries  
and energy**

**March 1986**

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The opinions expressed herein are those of the author and do not necessarily represent the policy of the Commission of the European Communities nor the European Investment Bank.

A French language edition of the present document is also available.

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Construction of the Sélingué Dam (Mali)

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PREFACE
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Few areas of human activity have undergone changes as sweeping as those that have taken place in the energy sector since 1958.

During the early days of the 1960s, Europe was swept up in a wave of economic growth unprecedented in both scope and duration. Few Europeans, save a few unheeded, far-thinking individuals (cf. the report of the "three wise men" of EURATOM), could have imagined energy to be other than an inexpensive, eternally abundant commodity, much less that it would one day stand as an obstacle to economic expansion.

Analyses dating from those days attributed underdevelopment in the newly christened "Third World countries" to insufficient invested capital, inadequate infrastructure, and other factors, while not one mentioned energy supply. Naturally, cooperation between burgeoning Europe and the Third World was based heavily upon those analyses.

In the space of a quarter century, the industrialized nations have been obliged to recognize that energy resources are limited and increasingly expensive. However, they have also learned that it is possible to live even better than before despite the higher cost of energy. Although considerable progress remains to be made in this field, it is already clear that economic growth and a better standard of living can be achieved while actually reducing energy consumption.

During that same period, it was learned that energy, in its various forms, was involved in all stages of the development process in the Third World, and that an energy crisis or oil shortage can shatter an industrialization process that is not yet well underway. Furthermore, in addition to the oil shortage, there exists a second energy shortage - that of fuelwood and traditional fuels - and that its repercussions are felt in all sectors by population groups throughout most of the Third World. Providing citizens with their daily bowl of millet or rice and producing milk for children are operations that entail the use of energy as much as making bricks, cement, or reinforced concrete for homes. It is no longer possible to conceive of either an industrialization strategy or a food strategy without also solving the problem of energy supply.

Energy is one of the sectors where North-South solidarity, made necessary by the cruelty of nature, has been prevalent. The people of the world must share energy reserves and use them to their greatest common advantage. Furthermore, harm caused to the environment, such as massive deforestation or desertification can affect the entire planet.

The European Economic Community has always held the opinion that solidarity should be more than just an obligation in times of crisis; it should be offered freely at all times. The industrialized countries should offer to share the fruits of their knowledge and experience with the developing countries, whose energy problems are undoubtedly more difficult to solve.

The European Economic Community has tried to do just that, by developing cooperation with its Third World partners in the energy sector following the successive oil shortages and the fuelwood shortage. The EEC's extensive and multifaceted cooperation has kept pace with new and unforeseen situations.

What does the future hold in store?

Doubtless, it is as difficult to predict what the energy situation in the world will be like in twenty years as it was to make the same prediction in 1958. Without too great a risk of error, however, it can be said that energy supply, which has gone through tense periods over the last decade, will not stabilize for long. New upheavals will occur.

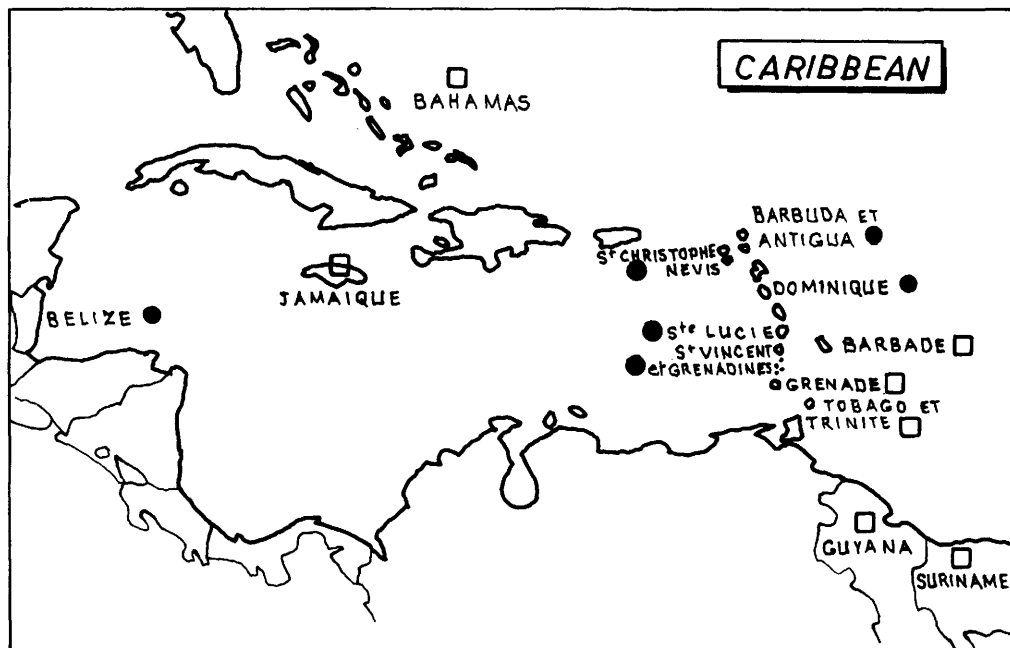
It can also be said that the reasons why solidarity between all nations is desirable, even essential, are not about to change.

Energy must remain a special field of cooperation between developed and developing countries, always ready to adapt to unforeseen circumstances, and this can only result from discussion between partners. For its part, the European Economic Community is open to discussion and prepared for innovation.

The present publication retraces the cooperation between the European Economic Community and the developing countries in the field of energy over the past quarter century; the graphics present an analysis of EEC cooperation from 1958 to 1983.

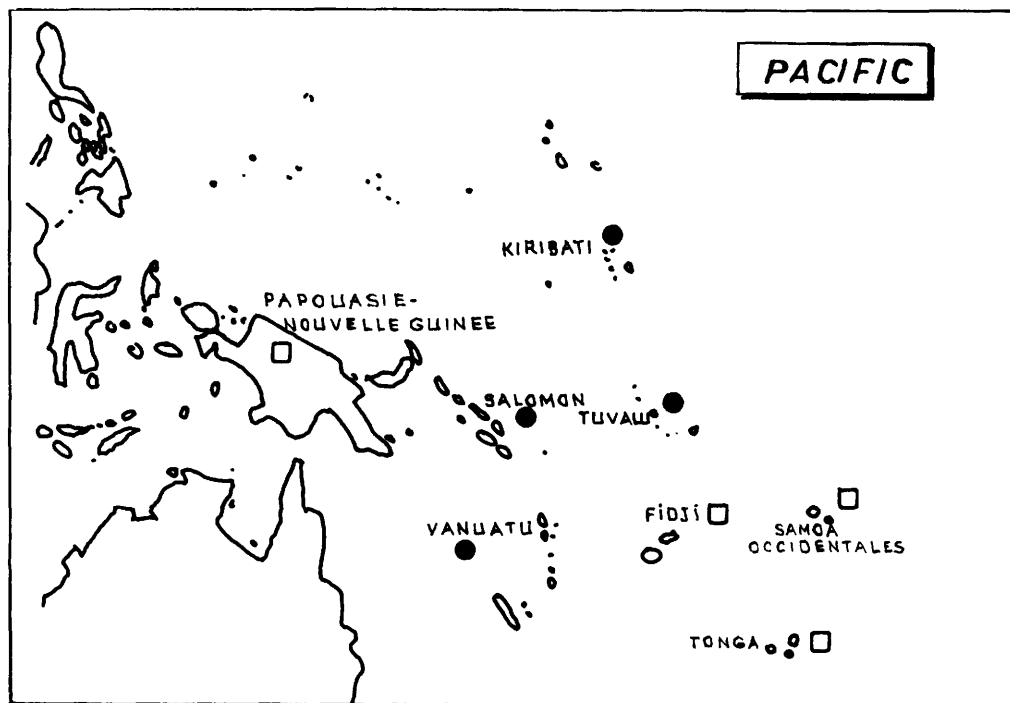
The supply and utilization of energy in the various sectors of human activity raise difficult problems for the developed countries of Europe and for most of the developing world. Those problems amply justify the need to draft a special presentation of energy cooperation between the EEC and the Third World, and to recapitulate the efforts that have been steadily increasing since 1958.

### CARIBBEAN

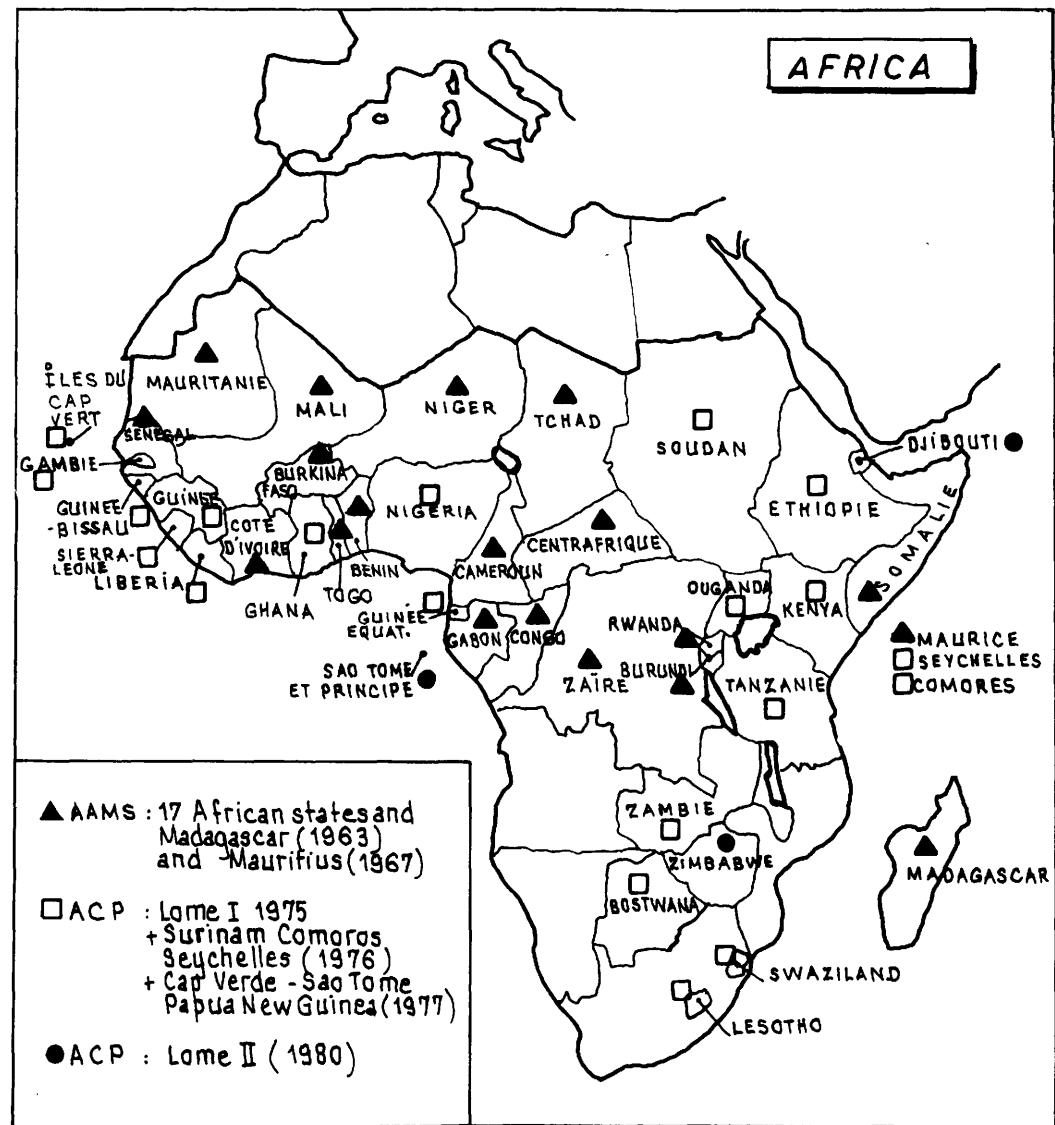


### THE A.C.P. STATES: AFRICA, CARIBBEAN, PACIFIC

### PACIFIC



### AFRICA





<p style="text-align: center;"><u>PART 1</u> EUROPE AND THE DEVELOPING COUNTRIES</p>
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Energy cooperation between the European Economic Community and the developing countries is far from being an isolated endeavor: in fact, it is part of the general framework of cooperation between these two major groups of countries.

However, the nature of energy cooperation has changed substantially since 1958. Its geographical scope has broadened considerably. It has taken on ever greater importance in increasingly diversified forms.

Thus, it is only fitting to open with a brief recapitulation of the changes that have occurred, in order to put energy cooperation in proper perspective.

#### THE ASSOCIATED STATES: FROM THE TREATY OF ROME TO THE LOME III CONVENTION

As early as 1950, in a declaration that marked the launching of the European Economic Community, Robert Schuman demonstrated that European unity could also provide the African continent with new impetus for development. He therefore proposed to make African development one of the Community's fundamental tasks.

The Treaty of Rome provided for an association of territories linked to the member states, and intended to encourage exchange and the common pursuit of economic and social development.

Although a large number of associated territories became independent nations shortly after the Treaty of Rome was signed, the European Economic Community proposed that they remain associated.

The new association between independent partners was set forth in the Yaoundé I Convention, signed in 1963, which linked 17 African states plus Madagascar to Europe through special cooperative relations.

Mauritius joined the eighteen, and Yaoundé II, a new convention signed in 1969, continued where the first left off.

In 1975, a third convention, this time signed in Lomé, gave added dimension to cooperation between the European Economic Community and the developing countries, as 46 countries were now associated with Europe. While the Convention was in effect, 13 other countries joined in the association. Special cooperative relations now extended beyond the African continent, to the countries of the Caribbean and the Pacific, considerably increasing the number of associated countries. The AAMS (Associated African and Madagascar States) became the ACP States (African, Caribbean, and Pacific).

In 1979, the Lomé II Convention was signed. Negotiations for a new convention, tentatively designated as Lomé III, were concluded at the end of 1984.

The ACP States now number 66. What is their profile?

### THE ACP STATES

The ACP States group together nearly 400 million people, that is:

8.6% of the world's population, or  
11.5% of the population of the developing countries (China included).

They all have a colonial past and have only recently gained their independence. Apart from that one common feature, they are an extremely diverse group.

In terms of size, nineteen are small, insular countries, most with populations well under 500,000. At the other end of the scale, Nigeria alone has a population of over 90 million.

In terms of degree of development, per capita GNP (1982) ranges from 80 dollars (Chad) to 6,840 dollars (Trinidad and Tobago), according to World Bank statistics.

Collectively, the ACP States are among the least developed nations. Of the 34 countries (with populations of over 1 million) whose per capita GNP was under 500 dollars in 1982, 22 were ACP States.

While all the ACP states combined account for 11.5% of the population of the developing countries, they only generate 7.5% of the GNP of those same countries.

## AGREEMENTS WITH OTHER THIRD WORLD COUNTRIES

Although the ACP States have benefited from special cooperation conditions, for historical reasons, the European Economic Community has not wished to limit its cooperation efforts to those countries alone.

The countries of the Mediterranean basin also have historic ties to the Community. Moreover, they form a zone of intense trade with Europe. About 15% of the Community's exports are bound for Mediterranean countries. That is as much as is exported to the United States, and far more than is exported to the Eastern bloc countries.

Thus, the Mediterranean basin has been considered a high priority region for European cooperation. In 1976, cooperation efforts took the form of financial protocols (which took effect in 1978) involving:

- 3 countries of the Magrheb: Algeria, Morocco, and Tunisia
- 4 countries of the Mashreq: Egypt, Jordan, Lebanon, and Syria.

Following the conclusion of commercial agreements with the Community several years ago, two additional Mediterranean countries, Malta and Cyprus, have begun to benefit from financial protocols analagous to the Maghreb-Mashreq Agreements. Other countries of the northern Mediterranean, although not considered to be developing countries, were also involved in the European cooperation scheme: Turkey (since 1963), Greece (before becoming an EEC member state), Yugoslavia, Spain and Portugal (as part of a pre-membership agreement), and Israel.

Lastly, the Community has signed several cooperation agreements with countries outside the Mediterranean basin involving more limited objectives.

## THE ECU

Conversion rates for the ECU as at 4 February 1986:

Belgian/Luxembourg franc	44.12105	Irish pound	0.714526
Deutsche mark	2.1624	Greek drachma	132.256
Netherlands guilder	2.44133	U.S. dollar	0.894587
Pound sterling	0.65369	Swiss franc	1.8308
Danish krone	7.96942	Spanish peseta	135.973
French franc	6.62531	Canadian dollar	1.2897
Italian lira	1,471.37	Portuguese escudo	140.814

Considering the diversity of conversion rates and the effects of changing prices, figures concerning trends in operations over the past 25 years should be interpreted with caution. However, an ECU deflator has been applied for comparisons between earlier operations and more recent ones (1983 is used as base year 100).

**LOME CONVENTIONS: BREAKDOWN BY TYPE OF FINANCING (1)** ECU in millions

	Managed by EIB			Managed by the Commission			
	Loans from EIB own resources	Operations using risk capital	Funds for interest subsidies on EIB loans	Other grants	Soft loans	Stabilization of export earnings (STABEX)	Special fund for the mining sector (SYSMIN)
Lomé 1	400	101	100	2,085	474	400	
Lomé 2 (2) 700 + 200 (3)		291	175	2,862	545	566	282
Lomé 3 (2) 685 + 415		600	210	4,570	600	925	415

- (1) These amounts include funds earmarked for the overseas countries and territories by virtue of the corresponding decisions of the Council of Ministers.
- (2) These figures do not include the cost of EEC missions carried out in the ACP States, which are financed from budgetary resources.
- (3) Arrangements mentioned in the declaration attached to the convention, including the possibility for EIB to grant loans of up to ECU 200 million from its own resources in favor of mining and energy investments in the common interests of the ACP States and the EEC.

## THE INSTRUMENTS OF FINANCIAL COOPERATION

### **Associated developing countries - ACP**

Cooperation operations with associated countries have been covered by global funding as provided for in the Yaoundé and Lomé conventions:

Treaty of Rome:	ECU 0.55 billion
Yaoundé I:	ECU 0.80 billion
Yaoundé II:	ECU 1 billion
Lomé I:	ECU 3.76 billion
Lomé II:	ECU 5.71 billion
Lomé III:	ECU 7.4 billion

(including provisions for the overseas countries and territories).

The table (opposite) shows the breakdown of funding, according to type, for the last two Lomé conventions.

The Lomé conventions do not provide for a per-country quota, only a lump sum. The goal is to ensure a reasonably balanced distribution of funding among the ACP states, although that breakdown is largely dependent upon the actual possibilities of those countries to utilize EEC assistance funds.

Financial cooperation is implemented by:

- **The European Development Fund (EDF)**, the main instrument of cooperation with the ACP States, which provides the associated States with funding for development projects in all economic sectors in the form of grants or soft loans (long term, very low interest rates).
- **Funds** administered by the Commission of the European Communities: **STABEX** (Stabilization System for Export Earnings), **YSMIM** (Systems of Stabilization of Export Earnings from Mining Products)
- **The European Investment Bank**, which grants loans (occasionally with interest subsidies) from EEC resources or from own resources. Financed by borrowings on the money market, these loans are granted for the funding of public or private investments, contingent upon the agreement of the government of the country concerned. They cover a maximum of 50% of the investment to be made.

The European Investment Bank also provides assistance to the ACP States in the form of venture capital (from EEC resources): assistance to governments for capital investments in companies, subordinated loans to be repaid under specific conditions, etc.

## **Magrheb-Mashreq**

As opposed to the Lomé Conventions, the Maghreb-Mashreq Agreements specify the amount of EEC funding for the development of each of the seven countries concerned in attached financial protocols. The first protocols, which were took effect in 1978, were followed by a new series of agreements that were recently ratified, containing provisions for maintaining assistance through most of 1986.

In all, ECU 1,685 million were granted or earmarked for the 7 countries, of which:

- 60% were granted as loans from the EIB's own resources
- 40% were offered in the form of EEC grants (particularly for interest subsidies on EIB loans) and soft loans.

## **Nonassociated developing countries**

Apart from the ACP States and the Mediterranean countries, an EEC financial and technical assistance program for nonassociated developing countries was implemented by the Commission starting in 1976. The program was designed to give priority to the least developed countries and assist the most underprivileged population groups in those countries, especially victims of catastrophes. Since 1982, a specific item in the Commission's budget has been devoted to integrated development in the nonassociated developing countries, for use by the European Parliament.

## **Other operations covering all the developing countries**

In recent years, the Commission has undertaken a certain number of other development operations for various reasons, funded from the Commission's budget, including:

- the cofinancing of development projects carried out by Nongovernmental Organizations (NGOs)
- the financing of energy programming in the developing countries
- a special program to fight hunger throughout the world.

### INCREASING DIVERSIFICATION TO SATISFY NEEDS

European Economic Community-Developing Country cooperation, which began 25 years ago in conjunction with a small number of African countries, has undergone considerable expansion and diversification.

**Geographical diversification:** by means of the different financial cooperation instruments which were implemented one after another, EEC assistance has been able to reach out to most of the Third World countries. The distribution of aid has clearly favored those countries that are most closely linked to Europe, on the one hand, and the least developed countries, on the other.

**Diversification in form:** satisfying the needs of the developing countries, tailoring assistance in accordance with the growth patterns of those countries, and providing aid based on an understanding of development problems has been a continuous concern of the EEC. The growth in cooperation conventions with the AAMS, then the ACP States, and the progressive diversification of operations offer proof of this commitment.



Desertification is a serious problem for a large number of developing countries.



<p style="text-align: center;"><u>PART II</u> <b>THE DEVELOPING COUNTRIES AND ENERGY</b></p>
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Satisfying the needs of the developing countries in the field of energy. What are their energy needs?

Most of the developing countries that are not oil producers must cope with the energy crisis in the same way as the industrialized countries, that is, paying considerably more for imported "modern" energy sources. However, they are more keenly affected than the industrialized countries, because their underdevelopment makes the burden of the additional cost more difficult to bear.

Furthermore, many Third World countries have been experiencing a second energy crisis, that of "traditional" energy sources - fuelwood, vegetable and animal waste - which are still fundamental in several regions of the world, not only in the least developed countries. Consumption and replenishment of traditional energy sources have not been keeping pace with demographic growth.

### ENERGY AND THE MODERN SECTOR

Since 1973, the developing countries that are not oil producers, just like the industrialized nations, have had to pay more for oil. Even though OPEC and some of its members have earmarked a small percentage of their oil revenue for assistance to the developing countries, they have not been selling their oil at special prices, even to the least developed countries, almost all of which have borne the full brunt of the oil shortages.

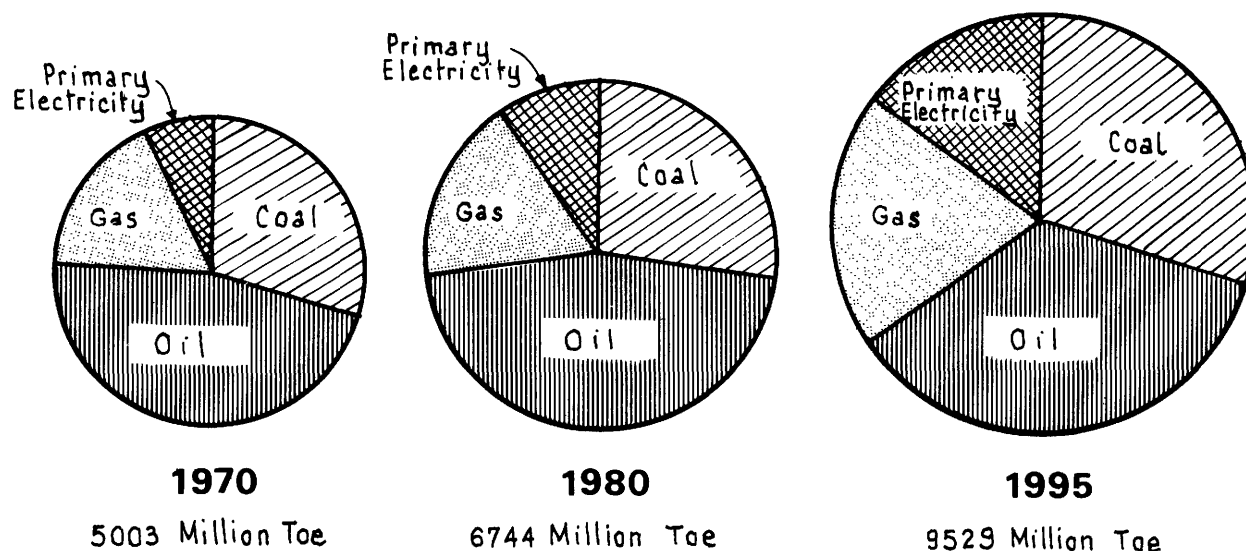
**COMMERCIAL ENERGY INVESTMENT REQUIREMENTS IN  
DEVELOPING COUNTRIES 1982-1992**

(World Bank)

(billion 1982 US dollars)

	Low Income Countries	Middle Income Countries		All Devel- -oping Countries	Annual Average 82-92 (incl.)
		Oil Importers	Oil Exporters		
<b>Electric power</b>					
Hydro .....	74.4	132.2	31.8	238.4	21.7
Nuclear .....	6.3	40.8	6.1	53.2	4.8
Geothermal .....	0.1	4.3	2.1	6.5	0.6
Thermal .....	43.2	75.8	39.7	158.7	14.4
Transm. & Distribution.	49.9	101.8	49.9	201.6	18.3
<b>Total .....</b>	<b>173.9</b>	<b>354.9</b>	<b>129.6</b>	<b>658.4</b>	<b>59.8</b>
<b>Oil</b>					
Exploration .....	21.2	48.9	99.1	169.2	15.4
Development .....	43.2	32.4	195.9	271.5	24.7
Other .....	2.5	6.0	16.7	25.2	2.3
<b>Total .....</b>	<b>66.9</b>	<b>87.3</b>	<b>311.7</b>	<b>465.9</b>	<b>42.4</b>
<b>Refineries .....</b>	<b>30.8</b>	<b>52.8</b>	<b>39.7</b>	<b>123.3</b>	<b>11.2</b>
<b>Natural Gas</b>					
Exploration, Development					
Transmission & Maintenance	17.5	16.8	30.2	64.5	5.9
Domestic distribution	4.3	4.7	7.4	16.4	1.5
Exports .....	0.0	3.0	6.2	9.2	0.8
<b>Total .....</b>	<b>21.8</b>	<b>24.5</b>	<b>43.8</b>	<b>90.1</b>	<b>8.2</b>
<b>Coal .....</b>	<b>55.2</b>	<b>27.2</b>	<b>6.3</b>	<b>88.7</b>	<b>8.1</b>
<b>TOTAL .....</b>	<b>348.6</b>	<b>546.7</b>	<b>531.1</b>	<b>1 426,4</b>	<b>129.7</b>

**SHARES OF FUELS IN WORLD ENERGY CONSUMPTION 1970-1995 (World Bank)**



Oil imports of the developing countries that are not oil producers

	1970	1975	1980
Net imports (millions of tonnes/year)	89.6	219.1	224.1
Cost of imports (in billions of constant 1980 dollars)	5.4	31.5	49.3

The above table shows the slowed increase in imports of petroleum products in the developing countries after 1975, as well as the sharp increase in their cost. It does not show, however, that imports actually decreased in 1982.

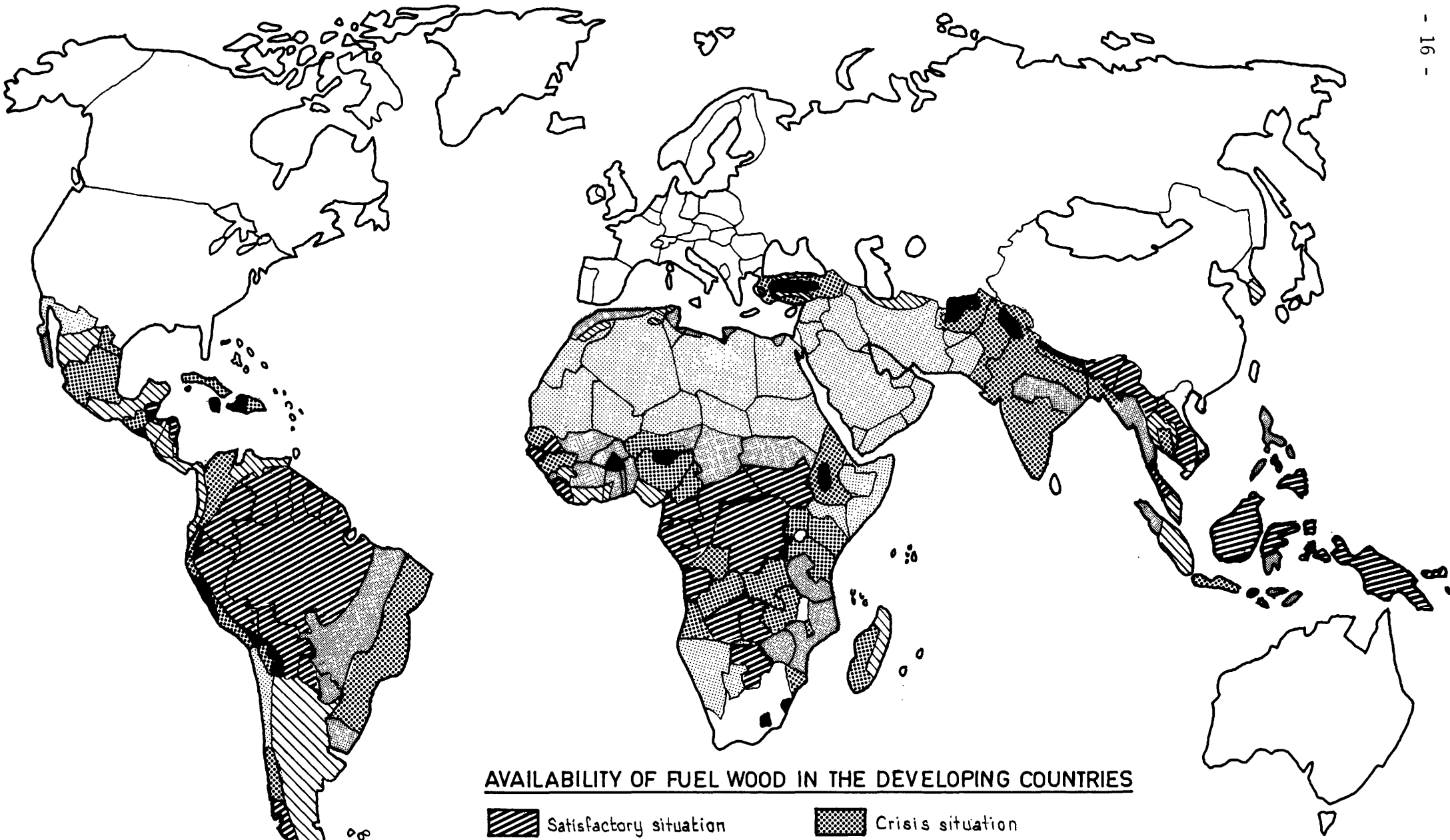
The developing countries have encountered problems analagous to those of the industrialized countries due to similar increases in the cost of energy. In the case of the developing countries, however, the effects have been more acute, as their economies are comparatively heavy energy consumers. They are also unstable and not as well balanced as those of the European countries.

In the Third World, energy consumption of the transportation sector alone is astounding, approaching 50% of the modern energy sources consumed in certain countries: 45% in Kenya, 43% in Thailand, 36% in Brazil, and 26% in India, as opposed to 20% in Europe. Accelerated growth in the major conurbations of the Third World and imbalances between economic sectors have fostered exaggerated development of transportation, known to be a major energy consumer, with respect to the rest of those economies.







Despite the paucity of available statistics on the subject, industry in the Third World appears to be more energy consuming, on the average, than in the industrialized countries. Indian industry, for example, consumes more energy than per tonne of steel, paper pulp, or cement produced than does European industry.

Furthermore, the investments needed to diversify energy sources are heavy: it is expensive to substitute coal or nuclear energy for oil. Those investments are even greater in the developing countries, where most technologies must be imported.

Considerable investment must also be made in order to save energy in industry or housing.



AVAILABILITY OF FUEL WOOD IN THE DEVELOPING COUNTRIES

- |  |  |
|--|--|
|  Satisfactory situation                     |  Crisis situation |
|  Acceptable situation, decreasing resources |  Shortage         |
|  Critical situation                         |  Desert           |



The Third World countries that are not oil producers must find new development models that are less energy hungry and less dependent upon imported petroleum products, an effort requiring know-how and capital. Some countries, however, have overcome the energy disadvantage. In South Korea, for example, a country that is entirely dependent upon imported energy, the energy crisis actually appears to have stimulated economic growth. This has also been the case for several Southeast Asian countries whose growth rates have dropped only slightly in recent years.

For many countries of Latin America, Africa, and Southeast Asia, the handicap has still not been overcome. Some see their growth rates collapsing, while others have indebted themselves without being able to maintain their growth rates at desired levels.

### ENERGY AND THE TRADITIONAL SECTOR

To consider the energy crisis as no more than an oil crisis would be tantamount to ignoring the energy dependence of the 60% of the Third World's inhabitants who live in rural areas, in relatively traditional societies. Moreover, 60% is only an average figure; up to 90% of the population of the least developed countries lives in rural areas.

For all these people, consumption of modern energy sources (oil, gas, and electricity) is not expressed in tonnes of oil equivalent, as is the case in the industrialized countries, but in kilograms of oil equivalent. The essential part of their daily energy needs are supplied from traditional sources (fuelwood, vegetable and animal waste). In some of the least developed countries, Sahelian Africa for example, up to 90% of all energy consumed comes from traditional sources. Even in India, where there now exists a sizable industrial sector, over 40% of all energy consumed continues to be supplied by wood and waste products.

Traditional energy sources, which are theoretically renewable, are becoming less and less renewable. The population explosion in the Third World has exacerbated depletion of forest resources due to the expansion of arable land, increasing herds, and the excessive extraction of wood for cooking. The population explosion has made the choice of using vegetable and animal waste as fertilizer or as an energy source a delicate matter.

In 1980, F.A.O. estimated that of the 1.3 billion people in the Third World experiencing fuelwood supply problems and depleting part of their forest resources every year, 100 million are experiencing a situation of acute shortage. F.A.O. also predicts that by the year 2000, if current trends continue unchanged, nearly 3 billion people will be affected by fuelwood supply problems, that is, two-thirds of the population of the Third World, and nearly half of mankind by that date.

These population groups are hardly affected by the oil shortage. In addition, it seems unlikely that oil will help solve the traditional fuel shortage for reasons of cost and availability of reserves.

The real problem facing those groups consists in switching from their current energy system, which is based on renewable energy sources, but which no longer meet the needs of those groups, to a new system, which is still based on renewable energy sources, but which offers higher performance and which is more capable of satisfying their current needs.

Traditional energy sources can no longer provide for the most basic needs of hundreds of millions of rural dwellers, including lighting, drinking water in adequate supply, and cooking. Those people see themselves as know bystanders to a world that is moving ahead, and their feeling of being pushed aside is undoubtedly a cause of the accelerated flight towards the major conurbations.

The developing countries in question have begun to respond to this second energy challenge by seeking to increase and diversify resources, while economizing traditional energy sources more than in the past. However, the hardest tasks in meeting that challenge still lie ahead.

### A PROBLEM AREA FOR VIRTUALLY ALL THE DEVELOPING COUNTRIES

Energy is a problem area for virtually all the developing countries.

It is a problem area for certain oil producing and exporting countries which cannot derive adequate financing for their development from their hydrocarbon resources.

It is a problem area for the "newly industrialized nations", many of which have indebted themselves in order to finance imports, particularly energy imports. In addition, a great many of those countries enclose rural areas that have remained relatively isolated from the development process and where the traditional fuel shortage is often keenly felt.

It also represents a problem for countries with moderate incomes as well as for the least developed countries, where the cost of energy imports stalls industrial development and where environmental problems are often critical.

These problems occur with varying acuity and in widely diverse forms, depending on a given country's dependence on oil imports and prevailing environmental conditions.

All countries, however, must find a way of fulfilling their citizens' legitimate desire to achieve a higher standard of living.

#### THE MUTUAL INTEREST OF COOPERATION IN THE FIELD OF ENERGY

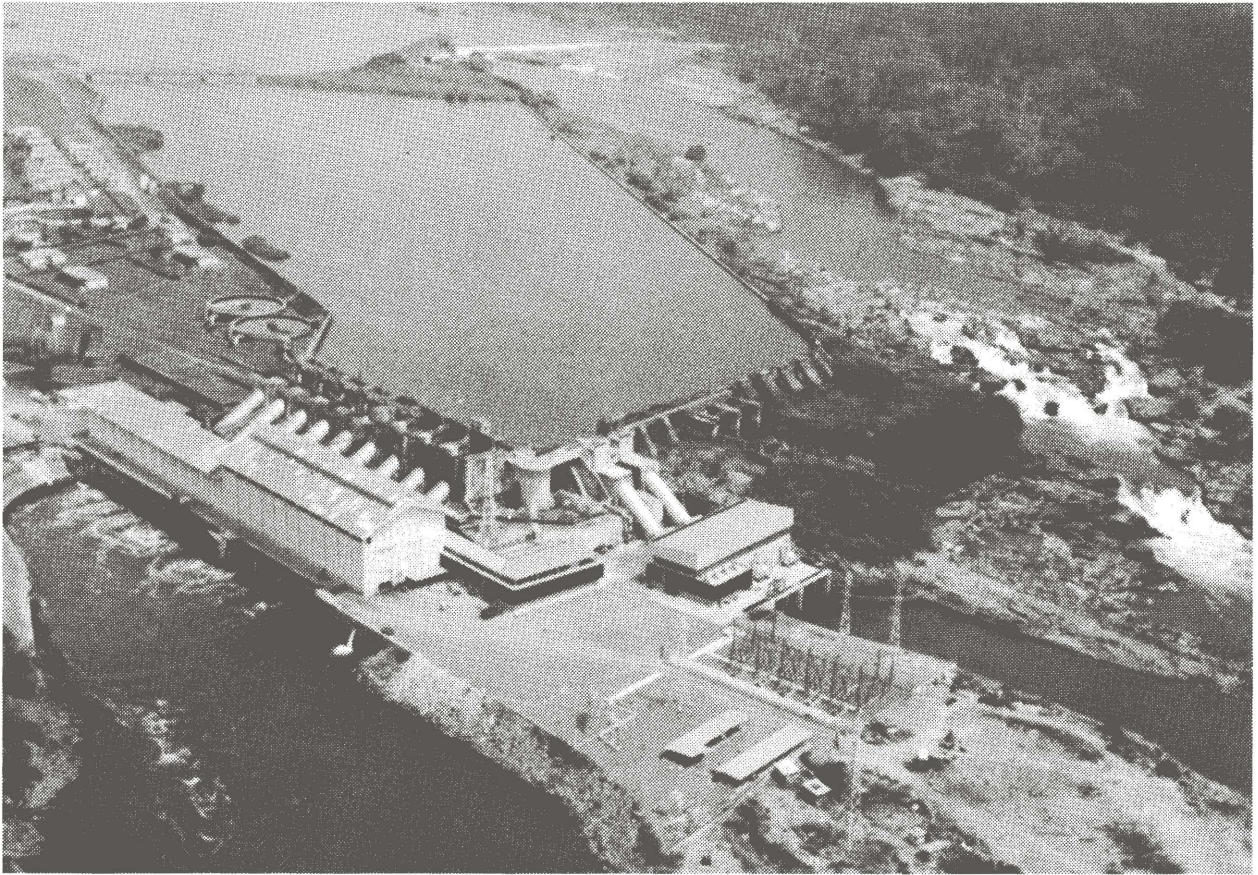
Finding adequate solutions to these energy problems in the Third World is in the common interest of Europe and the Third World countries.

It is in the general interest to help stabilize the world energy market and shelter it from upheavals, which are harmful to the development process in all countries.

It is in the general interest to bring to light new fossil fuels, especially in developing regions that have as yet been little explored, and to make new sources of energy readily usable.

It is in the general interest to cooperate in solving problems related to the utilization of energy, as many of Europe's problems are fundamentally similar to those of the developing countries.

Europe can no longer hoard the enormous wealth of scientific and technical expertise at its disposal, nor the mass of experience and know-how it has accumulated. Those commodities are most sorely needed by the developing countries, and access to them, for some countries, is a matter of survival.



Hydroelectric power stations: EDEA 3 - Cameroon (top)  
Mukungwa - Rwanda (bottom)



**PART III**  
**COOPERATION IN THE FIELD OF ENERGY**

**TRENDS IN COOPERATION FROM 1958 TO 1983**

**COOPERATION THAT BEGAN AFTER THE FIRST OIL SHORTAGE**

Before 1973, energy accounted for only a modest amount of the cooperation between Europe and the developing countries. Observers on both sides erroneously believed that oil was an endlessly abundant source of energy whose real cost could only continue to drop. Many developing countries were hesitant to develop their hydroelectric resources, entailing costly investment, as oil-fired thermal power stations were still largely preferable from an economic standpoint.

No one had as yet grasped the consequences that the population explosion would have on traditional energy sources, whose effects reached full force only during the second half of the century.

The first oil shock boldly emphasized the importance of energy, the one development factor decision makers consistently underestimated.

Shortly thereafter, at the first world conference on the environment, held in Stockholm, a few forward-thinking individuals warned of the consequences demographic growth would have on forest resources and traditional energy sources.

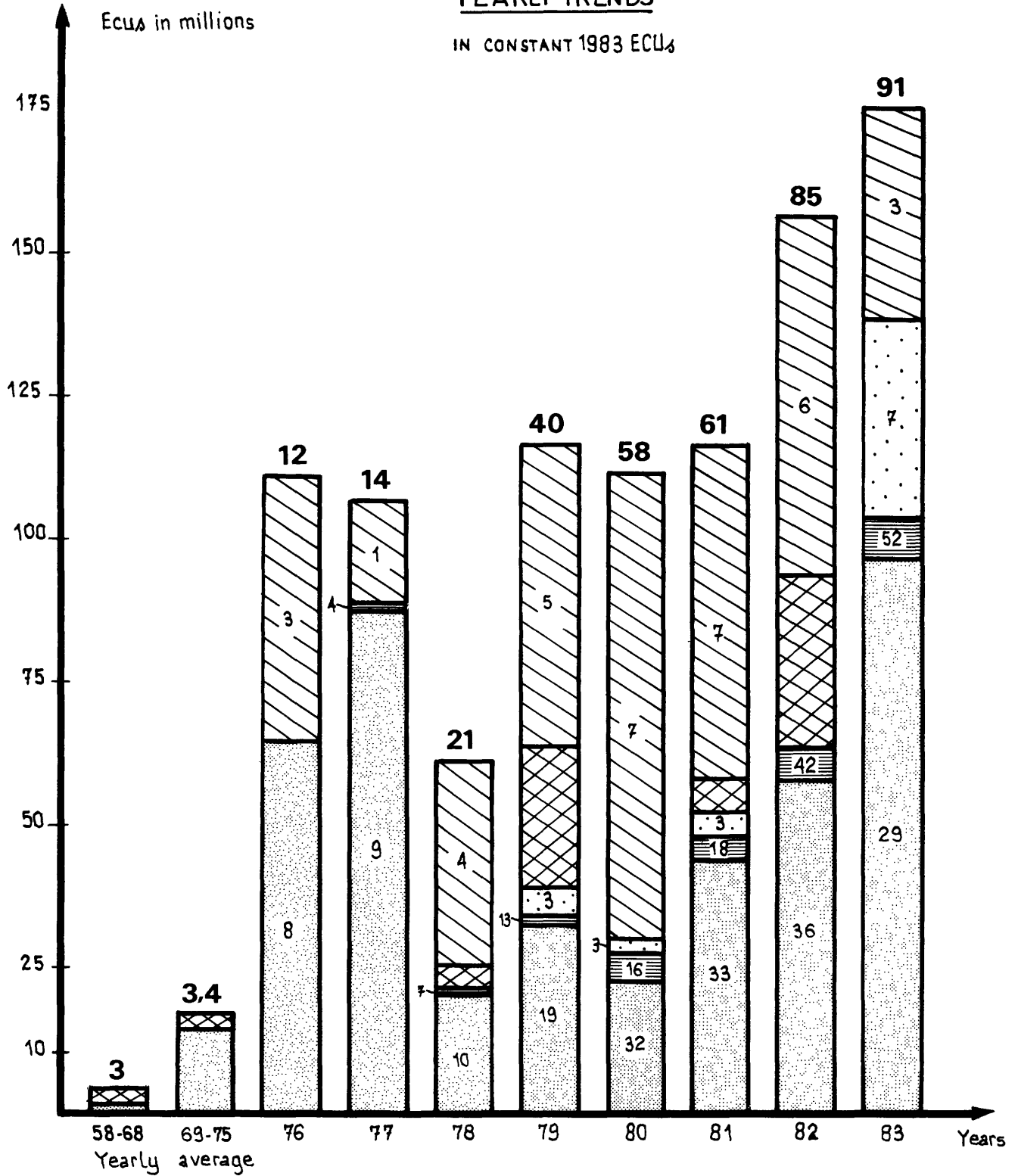
Despite those warnings, energy was still not included among the high priority areas of cooperation between Europe and the ACP States as set forth in the Lomé I Convention (signed in 1975). However, the urgency of the situation quickly imposed energy cooperation as a priority and, by 1976, the volume of efforts carried out in that field in the space of one year, surpassed all that had been done during the previous eighteen years combined.

Starting in 1977, the EEC budget included an item for energy cooperation with the Third World. As a result, its operations in the field expanded to include countries outside the ACP States.

In 1979, the Maghreb-Mashreq Agreements came into effect, and energy cooperation became even more diversified.

**EEC/DC ENERGY COOPERATION  
YEARLY TRENDS**

IN CONSTANT 1983 ECU<sub>4</sub>



- European Development Fund
- Magreb-Mashrek Agreements
- Budget Commission (DG 8-DG 17)
- European Investment Bank
- 8/(12)(Total) Number of projects
- Loans not subsidized by the EDF

### COOPERATION THAT BECAME STRONGER FOLLOWING THE SECOND OIL SHORTAGE

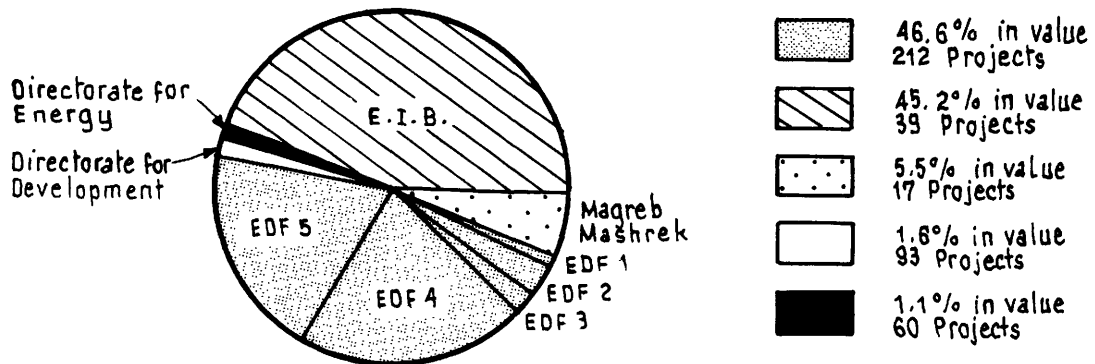
The second oil shortage demonstrated that in addition to being an important factor in development, energy could also prove to be a limiting factor, even an obstacle to growth. Clearly, isolated projects alone cannot resolve the energy crisis in a developing country; an overall approach is needed.

An increasing number of studies examining the supply of traditional energy sources showed that Sahelian Africa and parts of Asia and the Americas are heading towards a worrisome if not catastrophic situation. A sense of awareness developed, and decision makers acknowledged the inadequacy of isolated measures in this field. Again, an overall approach was going to be needed.

Energy programming operations were implemented under the heading of cooperation between Europe and the developing countries. Energy cooperation diversified, thereafter touching upon different aspects of the problem.

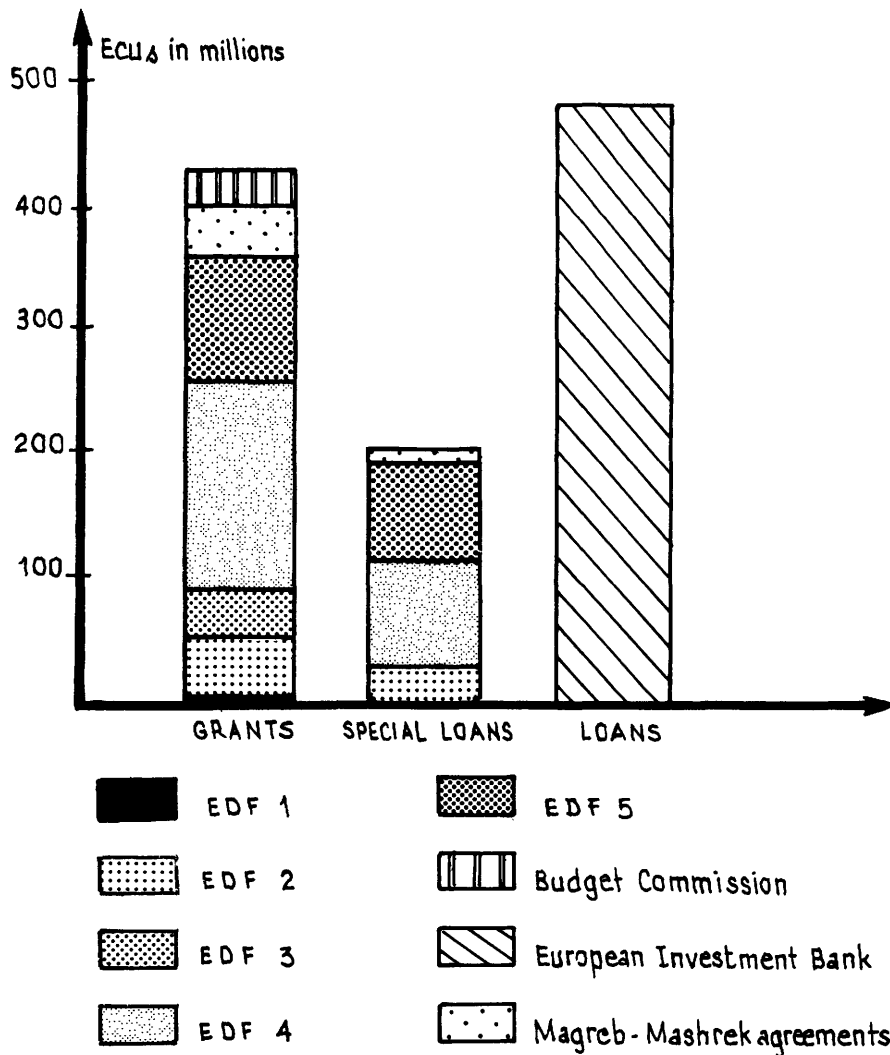
The field of energy illustrates the flexibility that has characterized cooperation between the EEC and the developing countries. Practically inexistent when energy was a minor issue, cooperation took on major proportions following a reaction time to the energy crisis that was relatively short, considering the limitations inherent in international relations.

**EEC/DC ENERGY COOPERATION  
RELATIVE DISTRIBUTION  
OF FINANCIAL INSTRUMENTS**



1958 - 1983 COMMITMENTS : 1100 Million in constant ECU 83

**EEC/DC ENERGY COOPERATION  
LOANS AND GRANTS**



## THE ROLE OF THE DIFFERENT COOPERATION INSTRUMENTS

Out of a total of 800 million current ECUs  
or 1,100 million constant 1983 ECUs devoted to energy,

the relative importance of the different financing instruments over the past 25 years can be seen in the graph on page 26.

Naturally, all EDF financing has been distributed among countries associated with the EEC (AAMS, then ACP States + overseas territories). In addition, a high percentage of financing from the EIB (71%) has been distributed those same countries.

The table below illustrates the degree of activity covered by the different cooperation instruments in the area of energy:

Financial instrument	Number of energy projects	Period	Number of countries concerned
EDF 1	2 projects	(61-71)	2 countries
EDF 2	23 projects	(65-75)	8 countries
EDF 3	11 projects	(71-75)	4 countries
EDF 4	101 projects	(76-83)	40 countries
EDF 5	75 projects	(81-83)	39 countries
EIB	39 projects	in progress)	
Maghreb-Mashreq		(67-83)	19 countries
Agreements	17 projects	(79-83)	7 countries
DG VIII	93 projects	(76-83)	43 countries
DG XVII	60 projects	(79-83)	20 countries

## LOANS AND GRANTS

Of the total of 1,103 million constant 1983 ECUs devoted to energy, loans and grants can be broken down as follows:

ECU 425 million have been distributed as subsidies (including 85 million devoted to subsidizing interest rates on loans)

ECU 198 million have been distributed as loans with special conditions

Considering that the EDF's soft loans include a partial grant (as defined by the Development Assistance Committee of OECD), it can be said that nearly 50% of EEC financial assistance in the field of energy has been distributed in the form of grants.

## A GROWING SHARE IN EEC OPERATIONS

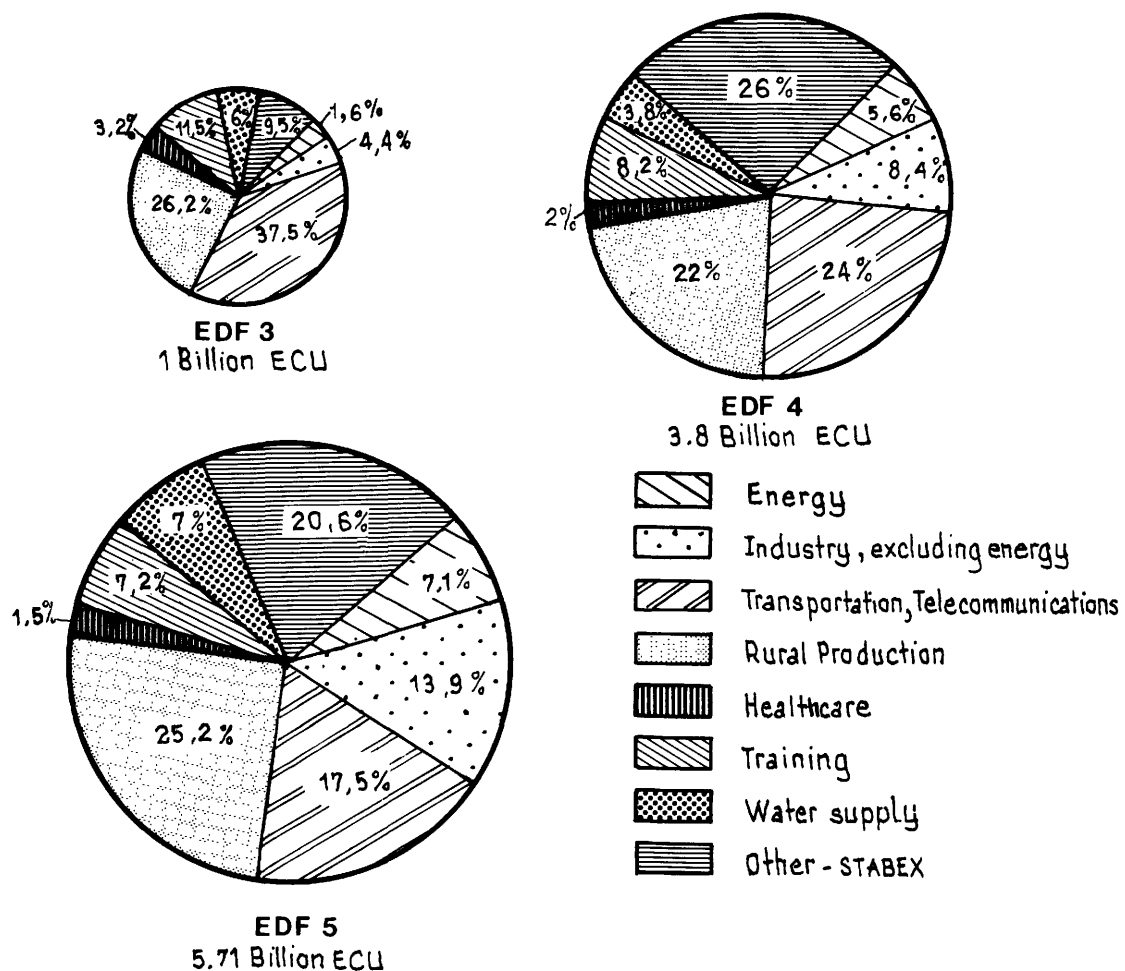
### Percentage of energy-related EDF and EIB financing for the developing countries

EDF 1:	EDF 2:	EDF 3:	EDF 4:	EDF 5: (*)	EIB 1976-80 (**)
0.13%	3.25%	1.66%	5.63%	7.1%	29.6%

(\*) percentage of all commitments made before 31 December 1983

(\*\*) percentage of the ECU 865 million in loans granted by the EIB as part of the Lomé Conventions

### THE RELATIVE SHARE OF ENERGY IN E.D.F. FINANCING



## THE SNOWBALL EFFECT OF EEC ASSISTANCE

In a large number of energy-related projects, EEC participation (Commission + EIB + member states) has directly enabled project realization and indirectly helped secure financing from other aid sources.

Highly effective cooperation with the the Arab funds and banks, in particular, has made it possible to earmark considerable sums for energy development. Other institutions, both multilateral (eg. World Bank) and bilateral (eg. Canadian International Development Agency) have also cooperated with the EEC.

As part of the Lomé I and II conventions alone, EEC assistance is considered to have generated ECU 2.5 billion for project financing in the ACP States.

### An example of multilateral cooperation: the Kpong project in Ghana

The Kpong project on the Volta River involves three operations:

- construction of a new dam
- construction of a hydroelectric power station
- construction of two high voltage transmission lines (60 and 80 km long).

It is designed to increase the installed capacity of the Volta River Authority to 160 MW, which should enable Ghana:

- to satisfy its growing electricity needs
- to continue to export electricity to its neighbors Togo and Benin.

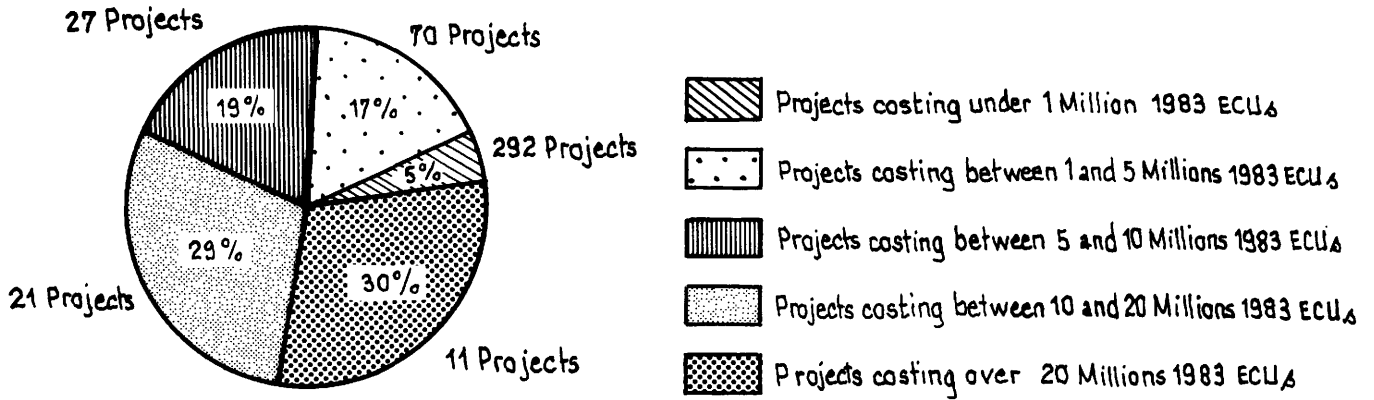
This project is one of the largest undertaken in Ghana since its independence. It includes a major operation involving irrigated farming, which extends beyond the simple aim of generating electricity.

In 1976, the project represented a total investment of ECU 214 million divided up as follows:

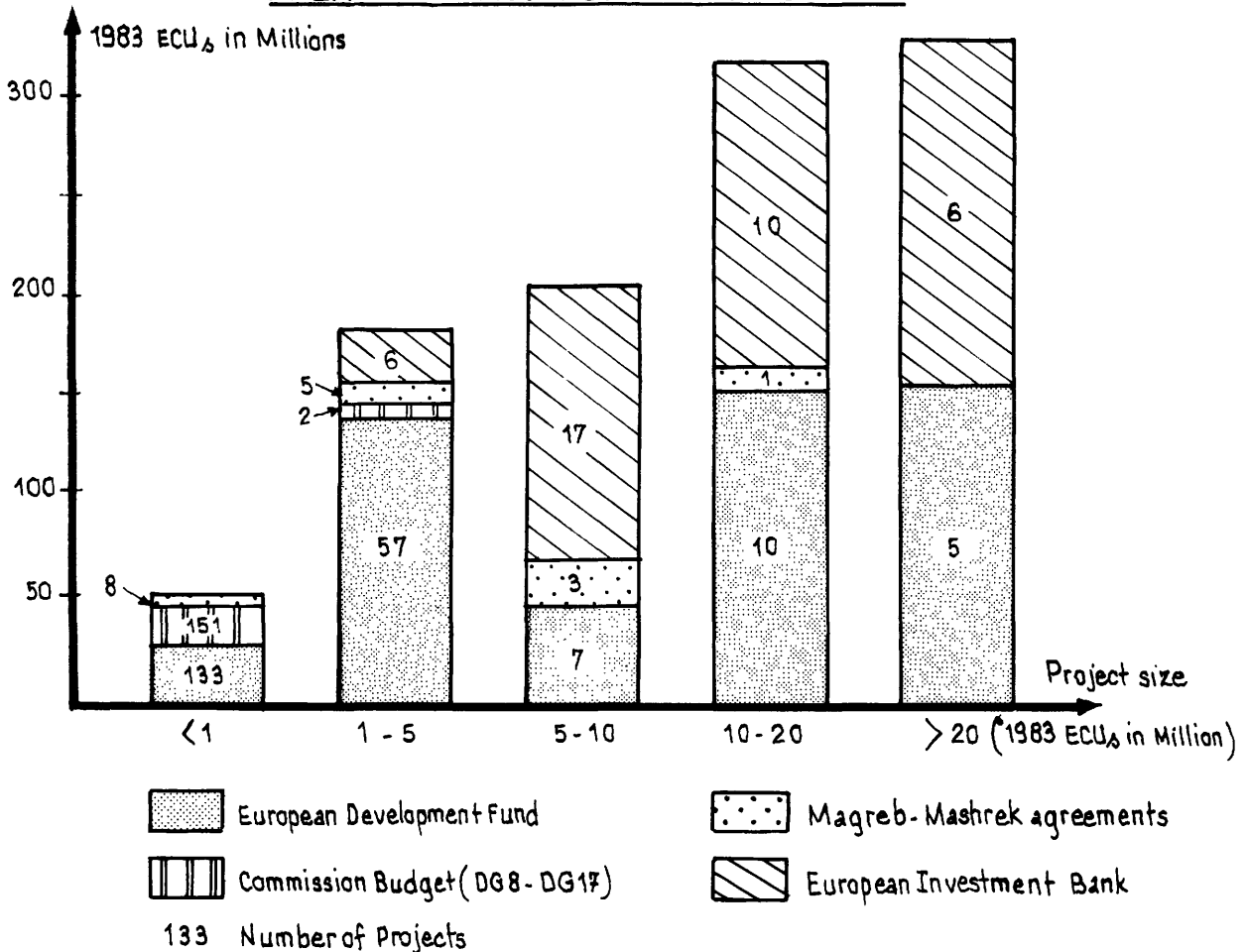
EIB	ECU 10 million	in subsidized loans from own resources (1976), 15 years at 6.5% per annum
EDF IV	ECU 1.2 million	in subsidized interest on the EIB loan
EDF IV	ECU 9 million	as a special loan (1977) 40 years, with a 10-year grace period for repayment and an interest rate of 1% per annum
World Bank	ECU 35 million	
Canada	ECU 35 million	
Arab funds	ECU 65 million	
Ghana	ECU 60 million	

In 1982, the European Commission detached a financial management expert to the Volta River Authority to help ensure optimum use of the funds allocated for the project.

**EEC COMMITMENTS TO THE DEVELOPING COUNTRIES  
IN THE ENERGY SECTOR:  
BREAKDOWN ACCORDING TO PROJECT SIZE**



**EEC COMMITMENTS IN THE ENERGY SECTOR  
BREAKDOWN ACCORDING TO PROJECT SIZE**





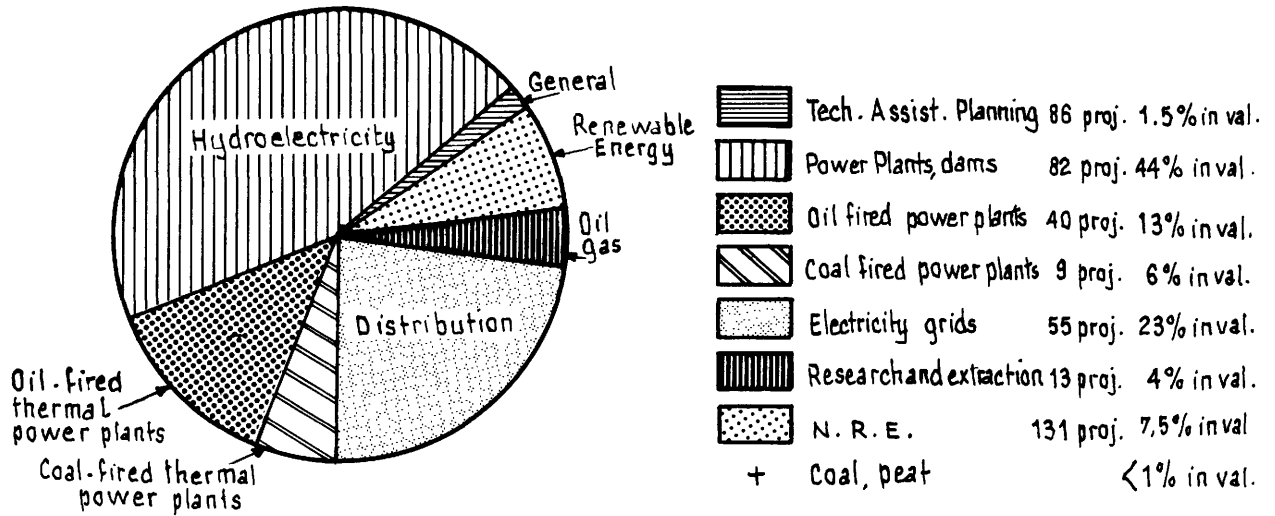
## HIGHLY DIVERSIFIED ACTION IN TERMS OF PROJECT SCOPE

Major investment projects: The EEC has provided assistance for major energy infrastructure projects: 33 financial commitments of over 10 million 1983 ECUs were allocated to 27 projects (see table below). Major projects accounted for 59% of all funds allocated. Moreover, heavy investments were involved in smaller-scale supplementary commitments in the form of studies, technical assistance, and interest subsidies; in value, they represented 66% of the amounts committed by the EEC as part of energy cooperation.

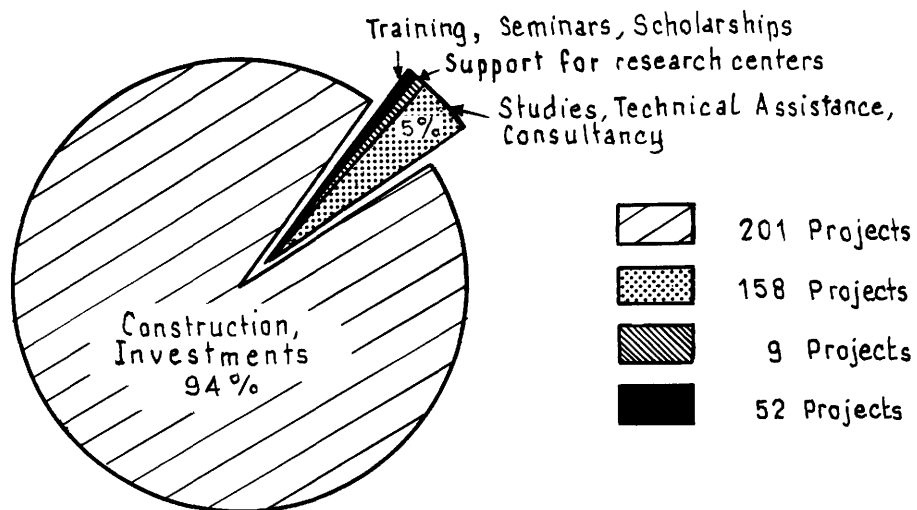
COUNTRY	YEAR	PROJECT	TYPE OF AID	ECUS IN MILLIONS	ECUS (1983) IN MILLIONS
BOTSWANA	1982	Morupule Coal-Fired Thermal Power Station	EIB loan	15	16.2
BURUNDI	1983	Rwegura hydroelectric power station	EDF V - special loan	10	10.
CAMEROON	1967	Edea hydroelectric power station	EIB loan	4	14.2
CAMEROON	1976	Song Loulou (hydroelectric power station)	EIB loan	13.5	24.3
CAMEROON	1983	Song Loulou (hydroelectric power station)	EIB loan	25	25
EGYPT	1979	Fuel-oil/gas-fired power station at Shoubrah el Kheima	EIB loan	25	35.5
EGYPT	1982	Development of natural gas reserves at Abukir	EIB loan	28	30.3
ETHIOPIA	1979	Geothermal drilling - 30 MW	EDF IV grant	13.2	18.7
ETHIOPIA	1982	Electrification of the region of Dessie	EDF IV grant	13.0	14.1
ETHIOPIA	1982	Electrification of the region of Dessie	EDF V grant	11.5	12.4
ETHIOPIA	1983	Derivation of Amarti 1	EDF V grant	17	17
ETHIOPIA	1983	Derivation of Amarti 2	EDF V special loan	16	16
FIJI	1978	Hydroelectric installation: Viti Levu	EIB loan	12.5	18.8
FIJI	1980	Hydroelectric installation: Fiji Islands	EIB loan	11.5	15.1
FIJI	1981	Hydroelectric installation: Fiji Islands	EIB loan	12	14.3
GHANA	1976	Kpong project	EIB loan	10	18
GHANA	1977	Kpong dam	EDF IV - special loan	9.0	14.7
IVORY COAST	1977	INTELCI	EIB loan	10	10.8
IVORY COAST	1982	Monitoring station for the Abidjan region	EIB loan	11	18
KENYA	1977	Retention dam on the Tana	EDF IV - special loan	26.3	43.2
LEBANON	1979	Thermal power station at Jieh	EIB loan	10	14.2
MALAWI	1977	Nkula Falls Hydroelectric dam	EDF IV - special loan	8.5	13.9
MALI	1976	Sélingué dam	EDF IV grant	12.2	21.9
MOROCCO	1983	Ait Chouarit dam	960 special loan + grant	17.5	17.5
NIGER	1981	Anou Araren Thermal power station	EIB loan	10.0	11.9
NIGERIA	1980	Electricity grid, region of Lagos	EIB loan	25	32.8
RWANDA	1973	HT power line: Kigali-Kigoma	EDF III grant	6.8	18
RWANDA	1973	HT power line: Kigoma-Mururu	EDF III grant	6.9	17.2
RWANDA	1976	Mukungwa hydroelectric power station	EDF IV grant	20.0	36.0
ZAIRE } BURUNDI }	1983	Ruzizi II hydroelectric power station	EDF V - special loan	17.2	17.2
ZAIRE	1969	Development of Inga (network)	EDF II - special loan	10.4	32.9
ZAIRE	1969	Development of Inga (network)	EDF II grant	9	28.6
ZIMBABWE	1982	Hwange thermal power station	EIB loan	20	21.7

A large number of small projects: Through nearly 300 projects costing under ECU 1 million, representing only 5% of total aid (an average of ECU 190,000) the EEC was able to diversify its assistance and satisfy the many different needs of the developing countries in the most effective manner possible. These projects concerned feasibility studies, marketing, planning, training operations, and small integrated development projects implemented by nongovernmental organizations.

**BREAKDOWN OF EEC/DC ENERGY COOPERATION  
BY TYPE OF ENERGY SOURCE**



**BREAKDOWN OF EEC/DC ENERGY COOPERATION  
COMMITMENTS ACCORDING TO TYPE OF PROJECT**



**THE EEC AND ITS MEMBER STATES:  
THE WORLD'S SECOND SOURCE OF AID FOR ENERGY DEVELOPMENT**

EEC aid in the different forms mentioned above and bilateral aid distributed by the member states combine to make the EEC the second largest source of financing for energy projects in the Third World, after the World Bank. The EEC is also the leading source of grants for energy development.

**COOPERATION ANALYZED ACCORDING TO ENERGY SOURCE**

In the space of 25 years, the European Economic Community has financed, in total or in part, over 400 projects involving energy.

Those projects can be broken down as indicated in the table below:

**Breakdown of projects involving energy**

(1983 ECUs  
in millions)

. electricity production .....	70	63 %
(including hydroelectric power) .....	485	44 %
. transportation and distribution networks .....	255	23 %
. energy reserves (fossile and renewable fuels) ..	53	4.8%
. energy planning .....	15	1.4%
. other (including research, training, and information) .....	66	6 %
	1,100	100 %

## A LARGE-SCALE EFFORT TO GENERATE AND DISTRIBUTE ELECTRICITY

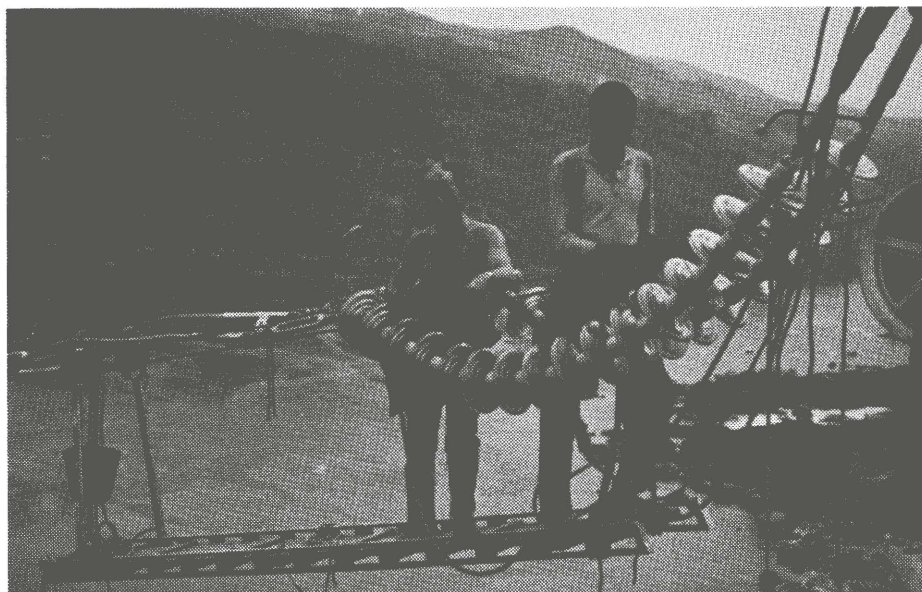
Projects involving the production, transmission, and distribution of electricity accounted for 87.5% of European Economic Community financing.

Special mention should be made of the sizable effort to assist the ACP States, most of which were heavily dependent upon oil, in diversifying their energy supply and developing their own primary energy sources in order to generate the electricity they need for development:

- over half of the funding distributed concerned hydroelectric power; examples of projects in which the EEC has participated include power stations in Cameroon, Fiji, Ghana, Kenya, and Mauritius
- some projects involved the use of national fossil fuel reserves, such as the power station fired by locally mined coal in Botswana
- still other projects indirectly made the improved use of regional resources possible, including the interconnection of the electricity grids of Ivory Coast and Ghana, two countries with vast hydroelectric potential.

In cases where oil-fired power stations proved to be the only economically viable alternative for supplying a country or region with electricity, the EEC participated in its financing. Examples include Djibouti, Liberia, Mauritius, Algeria (for supplying power to Saharan oases), and Lebanon.

The size of the loans granted for the development of transmission and distribution networks (Rwanda, Ivory Coast, Nigeria, Barbados, and Zaïre) is also worthy of note.



**Development of hydroelectric power sites:  
The Song-Loulou project (Cameroon)**

The purpose of the Song-Loulou project was to build a hydroelectric power station on the Sanaga River. The work, which began in 1973, consisted of building a retention dam, a power station, and transmission lines.

The aim of the project was to enable Cameroon's National Electric Company (SONEL):

- to meet the growing electricity needs of the cities of Yaoundé, Douala, Edea, and M'Balayo
- to provide electricity for Bafang, Bafoussam, Bamenda, Buea, Dschang, Fombam, Kumba, Nkong-Samba, and Victoria, by means of a 300-km extension of the grid.

In 1983, the Song-Loulou power station was expanded through the installation of two 48 MW turbogenerators, inlet structures, transformer stations, high tension power lines (120 km) and extensions to the facilities buildings.

In 1976, construction of the dam and the power station represented an investment of ECU 23.3 million. The EIB provided 58% participation through a loan subsidized by EDF IV (subsidy of ECU 2.2 million). France, Saudi Arabia, Kuwait, and the IBRD were involved in the project.

The extension of the project in 1983 cost ECU 125 million. The EIB participated in the effort with a loan of ECU 25 million subsidized by EDF V (subsidy of ECU 4.36 million).



Construction of electric transmission lines in Rwanda.

## A MAJOR EFFORT IN FAVOR OF RENEWABLE ENERGY SOURCES

Renewable energy sources (biomass, solar, wind, and geothermal energy, etc.) have aroused great hope within the Third World. Certain arid or semiarid countries, totally lacking in fossil fuels, have immense solar energy resources. The equatorial countries, for their part, possess sizable biomass reserves. Some regions are favored with considerable resources in wind, geothermal, or wave energy.

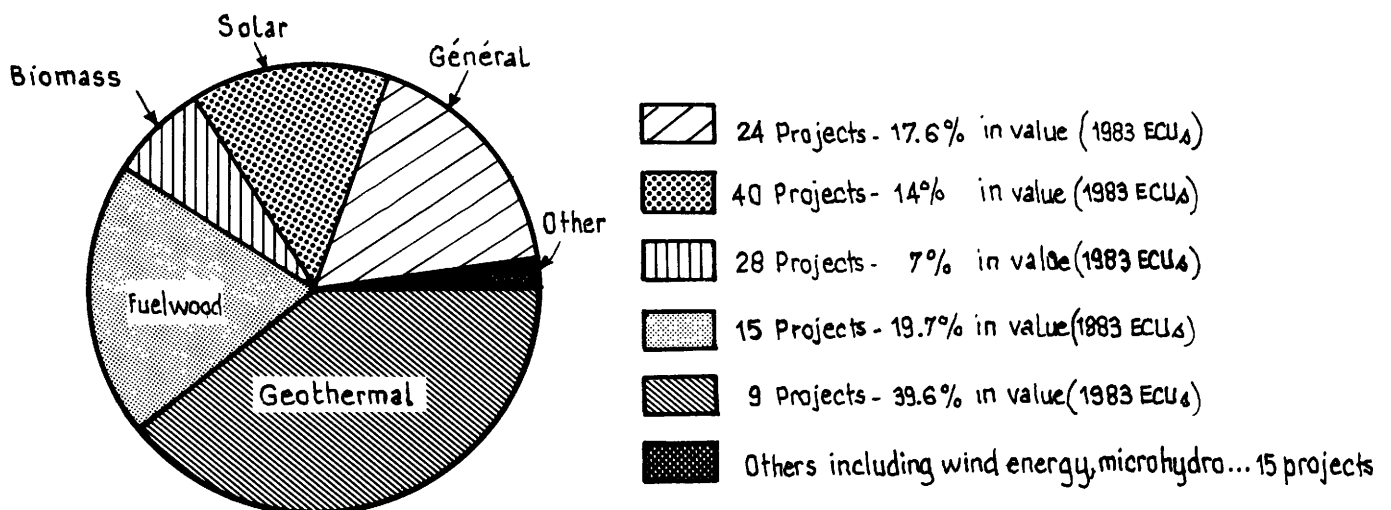
Mobilizing domestic energy resources for national development is a highly attractive prospect, especially since renewable energy sources can be harnessed and utilized in a highly decentralized manner. That feature is appropriate for the rural world, which consumes little energy and whose needs are scattered. Renewable energy sources can be applied to development patterns that differ fundamentally from those of the industrialized world.

Until now, their rational use has been delayed by high investment costs. Some observers have even come to the conclusion that renewable energy sources have little or no future in the Third World.

The European Economic Community, however, remains confident that renewable energy sources can indeed play an important role in the developing countries, especially in rural areas, in the relatively distant future.

The EEC has earmarked a total of 83 million constant 1983 ECUs, that is, 7.5% of all funds allocated to the energy sector, for the development of such energy sources in the Third World.

## EEC/DC COOPERATION IN THE FIELD OF RENEWABLE ENERGY SOURCES BREAKDOWN BY TYPE OF RENEWABLE ENERGY SOURCES



Two important projects, in Kenya and Ethiopia, have dealt with geothermal energy. In comparison, about forty projects have involved efforts to develop solar energy. Many of those projects were implemented in villages by Nongovernmental Organizations (NGOs) which promote goodwill to improve the living conditions of local population groups.

Persuading population groups to accept renewable energy projects that conflict with their habits is a lingering problem. For that reason, the Commission has paid particular attention to the inclusion of renewable energy equipment in the daily context of local population groups when carrying out projects. By coordinating its activities with those of the NGOs, which have extensive experience in the field, the Commission has been meeting the need of local population groups to participate in projects involving renewable energy sources.

#### **A project to be consolidated: CRES**

CRES (the Solar Energy Research Center) is an organization founded in 1978 by the authorities of the CEAO (West African Economic Community) and CILSS (Permanent Interstate Committee for Drought Control in the Sahel) to enable the nine member states to integrate extensively new and renewable energy sources into their respective development programs.

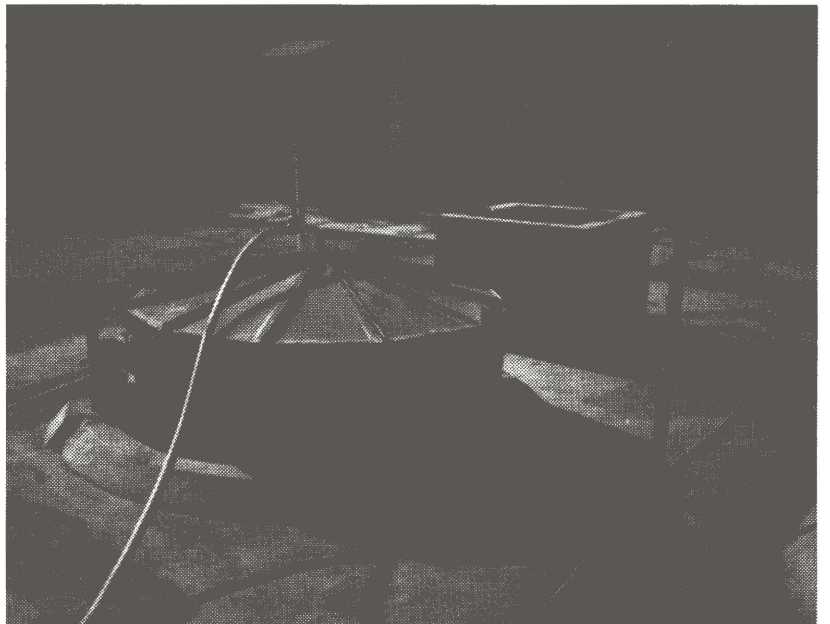
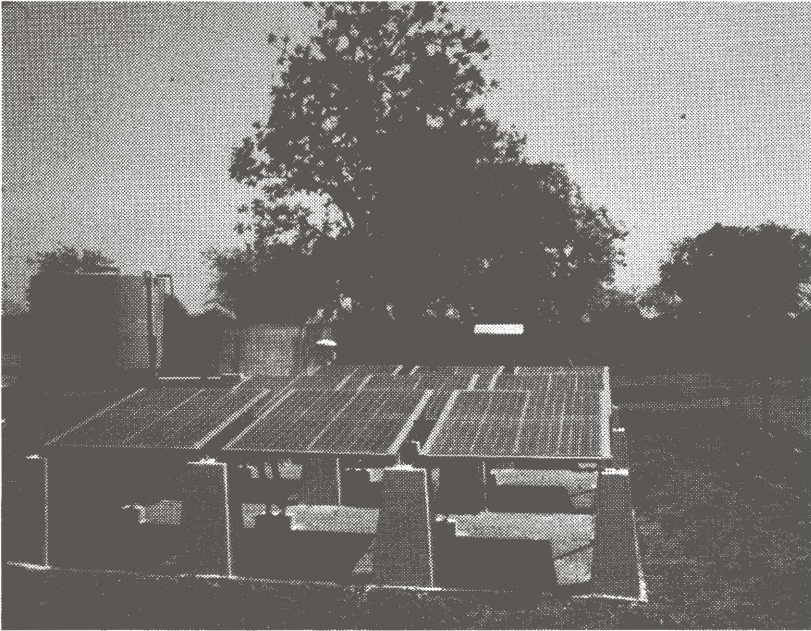
From the outset of the project, the EEC committed itself to the implementation of CRES, which was to be carried out in two phases:

- 1982-84: program to set up the BER (bureau for study and implementation) responsible for launching the preliminary operations for project start-up, including information, training, equipment programming, and support for national centers.
- 1983-85: construction of and providing equipment for local laboratories at the center located in Bamako (Mali).

The expected results from the CRES project (including development of local resources, energy savings, and water control) should contribute to the development of the Sahel countries.

The EEC participated in this important project in different ways: provision of technical assistance, funding for the training and information campaign, experimentation, financial support for the launching program, and the construction of facilities.

The various operations cost over 3 billion 1983 ECUs, that is, about 10% of the total cost of the start-up project. Other investors included France, the Federal Republic of Germany, UNDP, OPEC, ADB (African Development Bank), and CEAO.





### CONSIDERABLE COMMISSION SUPPORT FOR NONGOVERNMENTAL ORGANIZATIONS

Thanks to their presence in the field and their sense of commitment, nongovernmental organizations have often operated effectively in rural development. The basic areas of rural development (water, health care, hygiene, education, and production) generally require energy.

The Commission has understood the need to support direct efforts conducted by the NGOs, in addition to offering assistance in enormous investment projects (dams, hydroelectric and thermal power stations).

Support for NGOs, made up exclusively of grants, has been taken from the Directorate General for Development's own budget (Articles 941 and 945).

Among the projects coming under the heading of Articles 941 and 945, for which a total of ECU 4.2 million in grants has been distributed, 55 had "energy" as a major component. The unusual feature of EEC support for NGOs is the fact that the EEC provides 45% of project funding, the villages and communities concerned provide an average of 5%, and the NGOs themselves supply the remaining 55%. In most cases, a contribution made by a village (even token) indicates the village's commitment to the success of the project.

In rural areas, the NGOs have contributed greatly to the implementation of renewable energy systems (in 47 projects out of 55): photovoltaic pumps and systems (45%), manufacture and installation of multiblade wind turbines (14%), systems for the rational use of biomass (25%), micro hydroelectric power stations (7%), local mini-grids (5%), and distribution of improved stoves to limit fuelwood consumption (3%). Lack of an extensive electricity grid and distance from urban centers are reasons for choosing renewable energy sources in rural areas.

The dynamism of the French-speaking NGOs and the crucial needs explain why three countries of the Sahel (Mali, Senegal, and Burkina Faso) together have received 52% of all aid from the NGOs; Africa alone has taken advantage of 94% of aid from NGOs.

#### Photographs (opposite page):

- Photovoltaic pumping station (upper left)
- Multiblade wind pump (upper right)
- Improved stove (lower left)
- Biogas installation (lower right)

## A MAJOR EFFORT IN ENERGY PLANNING

There are many ways by which the developing countries can make considerable inroads towards overcoming their energy problems, including gaining familiarity with their potential energy resources, analyzing their needs in detail, studying possible energy savings in the various economic sectors, programming energy supply and investments to be made in each sector, and setting up a coherent rate structure for the distribution of the different types of energy.

Europe has gained considerable experience in trying to solve its own problems.

Cooperation in this field first took the form of methodological research, intended to adapt European experience to specifically Third World problems. It then consisted of helping to develop statistical instruments, draft case studies, and implement training operations and exchanges of experiences through organized seminars.

It greatly helped decision makers grasp their country's energy situation in order to draft and implement an effective energy policy.

In all, 15.3 million constant 1983 ECUs have been devoted to this form of cooperation, of which a large percentage was distributed in non-ACP States.

<p style="text-align: center;"><b><u>PART IV</u></b></p> <p style="text-align: center;"><b>COOPERATION TOMORROW</b></p>
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What will be the profile of energy cooperation tomorrow?

Naturally, it will depend on trends in the world energy market. Past experience has shown that such trends are not easy to predict. In any case, according to the nature of the world energy supply situation, it seems unlikely that there will be a return to inexpensive energy in upcoming years. The cost of energy, or at least petroleum products and derivatives that will become scarcer, will remain high. Moreover, as a select few of the world's regions continue to play a leading role in energy supply, disorganized development is not to be ruled out.

Cooperation will also depend on the developing countries, partners with which the European Economic Community has always undertaken to maintain open lines of communication in designing joint operations and determining the manner in which those operations should be executed.

Those efforts must be given direction in order to be fruitful. Along those lines, the EEC must first define the parameters and goals of its work in the field of energy in terms of the broader scope of relations it wishes to maintain with the ACP States, in particular, and with the developing countries, in general.

## **ENERGY AND DEVELOPMENT IN THE FUTURE**

### **Agriculture, environment, and energy**

The European Economic Community has confirmed its intention to give priority to agriculture in its cooperation with the Third World. It has chosen agriculture because entire regions of Africa and other continents, which were formerly able to satisfy their own food needs, have ceased to be able to do so, and are becoming increasingly dependent upon food aid or food crop imports from year to year.

A continuation of those trends into the 21st century would lead to unacceptable situations. Some countries would be required to import nearly half the grains they need to feed their citizens, having to choose between imported energy and imported food for survival. Hunger would spread, and the environment would deteriorate faster than before through widespread deforestation, overgrazing, and soil depletion due to overcultivation of forests, pastures, and farmland. As a result of environmental deterioration, food production would become increasingly difficult.

**Excerpt from the Lomé III Convention:  
The goals of energy cooperation tomorrow**

DEVELOPMENT OF MINING AND ENERGY POTENTIAL

ARTICLE 75

Considering the seriousness of the energy situation in the majority of the ACP States, resulting in part from the crisis caused by dependence on imported petroleum products and the growing shortage of fuelwood in many countries, the ACP States and the Community agree to cooperate in this area for the purpose of finding solutions to their energy problems.

ACP-EEC cooperation attaches particular importance to energy programming, conservation and rational use of energy, recognition of the energy potential and the promotion of new and renewable energy sources under appropriate technical and economic conditions.

ARTICLE 76

The Community and the ACP States recognize the mutual benefits of cooperation in the field of energy. This cooperation advances the development of the potential of conventional and unconventional energy sources as well as the self-sufficiency of the ACP States, and in this respect, it is intended to achieve the following objectives:

- a) encourage economic development through the profitable use of national and regional energy resources
- b) improve living conditions in urban and periurban areas and within rural settlements, taking the energy factor into account in the various cooperation actions
- c) protect the natural environment by attenuating the effects of demographic growth on the consumption of biomass, and especially of fuelwood.

ARTICLE 77

As part of efforts to achieve the abovementioned goals, energy cooperation actions can concentrate on the following points at the request of any of the ACP States concerned:

- a) gathering, analyzing, and disseminating adequate information
- b) reinforcing the ACP States' management and monitoring of their energy resources in accordance with their development goals, in order to enable them to assess energy supply and demand and to evolve strategic energy planning, by providing agencies responsible for the design and implementation of energy policies with the means of support for energy programming and technical assistance, among other measures
- c) analyzing the implications of development programs and projects in the energy field, taking into account energy savings to be achieved and the possibilities of using substitutes for primary energy sources, especially new and renewable energy sources
- d) implementing appropriate programs of action based on small and medium-sized energy development projects, particularly as part of efforts to save fuelwood and find substitute energy sources for it
- e) developing the potential for investment in the exploration and economic development of national and regional energy sources, as well as for the economic development of specific energy production sites which allow for the creation of high energy intensity industries
- f) promoting research, adaptation, and dissemination of appropriate technologies, and training to meet manpower needs in the energy sector
- g) reinforcing the research and development capabilities of the ACP States, especially in the area of new and renewable energy sources
- h) rehabilitating basic infrastructures needed for the production, transmission and distribution of energy
- i) encouraging cooperation among the ACP States in the energy sector, including cooperation actions between the ACP States and neighboring states which receive Community aid.

For these reasons, the EEC has decided to give priority to food strategies, in which energy is clearly an important factor.

The fundamental task for many of the world's developing regions is to design and implement new systems that will use the natural environment to provide food and energy for an increasing number of people, not only to enable them to survive, but to improve their standard of living, while maintaining the ecosystem intact.

Offering assistance in carrying out that task, which involves close interaction between agriculture, herding, environmental protection, and energy, is a leading priority.

### Industry and energy

Man does not live by bread alone. With that in mind, the newly industrialized developing countries have been concentrating on industrial expansion.

The European Economic Community can and must offer assistance in that area, helping countries consolidate industrial complexes that may have grown weak or uncertain, opening domestic and export markets for industrial products, and promoting the healthy development of national industries.

Adequate energy supply and rational energy consumption are prerequisites for the proper development of industrial enterprises.

This could be a second priority in energy cooperation tomorrow.