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REPORT

drawn up on behalf of the Joint Committee

on ACP-EEC cooperation in the field of energy

Rapporteur : H.E. Mr Nuri Khalil SIDDIG

English Edition

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On 26 September 1980 the Joint Committee decided to set up an ad hoc Working Group on ACP-EEC cooperation in the field of energy.

On 21 January 1981 H.E. Mr N.K. SIDDIG (Sudan) was appointed rapporteur of the ad hoc Working Group on ACP-EEC cooperation in the field of energy.

This Working Group met on 21 January 1981 in Brussels, on 26 February 1981 in Freetown (Sierra Leone), on 11 September 1981, 1 December 1981 and 26 January 1982 in Brussels.

The ACP-EEC Joint Committee unanimously adopted the draft motion for a resolution and explanatory statement presented by Mr SIDDIG on 4 February 1982 in Harare (Salisbury) (Zimbabwe).

Present: Mr Bersani, Co-chairman, in the chair; Mr Butagyira (Uganda), Co-chairman; Mr N.K. Siddig (Sudan), rapporteur; Barbados, Benin, Botswana, Burundi, Cameroon, Mrs Carettoni Romagnoli, Mr Carossino (deputizing for Mr Denis), Mrs Cassanmagnago Cerretti, Mrs Castellina, Mrs Castle, Central African Republic, Mr Cohen, Congo, Mr Deschamps, Djibouti, Mr Enright, Mrs Ewing, Mr Fergusson, Mr Ferrero, Mr Fich, Fiji, Mrs Focke, Mr Früh, Gabon, Gambia, Ghana, Mr Glinne, Grenada, Guinea, Mr De Goede (deputizing for Mr Boserup), Mr Haagerup, Mr Hume, Mr Irmer, Mr Israel (deputizing for Mr Clement), Ivory Coast, Jamaica, Mr Jaquet, Mr E. Kellett-Bowman, Kenya, Mr Kirk, Mr Kühn, Mrs Lentz-Cornette (deputizing for Mr Estgen), Lesotho, Liberia, Mr Ligios (deputizing for Mr d'Ormesson), Mr Loo, Mr Luster, Malawi, Mali, Mauritania, Mauritius. Mr Michel, Mr Moreau, J., Mr Narducci, Niger, Nigeria, Mr Normanton, Papua New Guinea, Mr Penders, Mrs Poirier, Mr Poniatowski, Mrs Pruvot(deputizing for Mr Sablé), Mr Puletti, Rwanda, Senegal, Mr Schieler, Mr Konrad Schön, Mr Seeler (deputizing for Mr Colla), Somalia, Suriname, Swaziland, Tanzania, Mr J.D. Taylor, Togo, Tonga, Trinidad & Tobago, Mr Turner, Upper Volta, Mr Vandewiele, Mr Vergeer, Mr Vitale (deputizing for Mrs Baduel Glorioso), Mrs Walz, Mr Wawrzik, Mr Woltjer, Zaïre, Zambia, Zimbabwe.

A

The Joint Committee hereby submits to the ACP-EEC Consultative Assembly the following motion for a resolution, together with explanatory statement

MOTION FOR A RESOLUTION

on ACP-EEC cooperation in the field of energy

The ACP-EEC Consultative Assembly,

- having regard to the report of Ambassador SIDDIG, (Doc. ACP-EEC 34/81)

1. Is seriously concerned by the precarious energy situation of the great majority of ACP nations, particularly their dangerously high level of dependence on imported oil which imposes an intolerable burden on the economies of the importing states;

2. Notes
   - that energy consumption per capita in the ACP is some 40 times less than in the EEC,
   - that economic development will inevitably lead to higher energy consumption, thereby imposing concomitant strains on the balance of payments situation of those countries concerned, unless the most vigourous remedial measures are taken,
   - that while the very close link that had hitherto existed between economic growth and increased energy consumption has, in certain cases, been broken, this has been made possible only by a level of capital investment in research and equipment that would be beyond the unassisted reach of almost all energy-importing ACP states,
   - that, at present, lack of readily available energy resources at reasonable cost is one of the principal factors inhibiting economic development in most ACP states, and particularly in the poorest among them;

3. Is aware of the fact that available statistics of energy use in the ACP countries refer only to the commercial energy sector, while in some of these states non-commercial energy sources can account for well in excess of 50% of energy needs;

4. Notes that increased population pressure and depletion of forestry resources have reduced the availability of non-commercial fuels in many ACP countries, thereby leading to further demand for imported commercial energy sources;

5. Shares the preoccupation expressed by the U.N. Conference on New and Renewable Sources of Energy (Nairobi - August 1981) regarding the disastrous effects of cutting down forests, which gives rise to soil erosion and desertification;

6. Feels that, despite some positive achievements, the level of funding for ACP-EEC cooperation in the energy sector to date has been inadequate, and maintains that greater emphasis on energy cooperation, and enhanced funding, is called for by the current world energy situation;

7. Welcomes the inclusion of a specific sector devoted to energy cooperation in the Convention of Lomé II, and notes that this agreement provides for wide-ranging assistance for energy and related projects both through EDF grants, special loans and EIB loans;

8. Recognizes, however, that the finance available under the EDF is limited, and that if funds are used for energy projects, then less is available for other important sectors;

9. Insists, nevertheless, that the energy provisions of the Convention be fully implemented, and notes that their utilisation depends on the priority accorded to energy projects by ACP governments and the encouragement given by the Commission of the European Communities to such projects;

10. Calls on the Commission of the European Communities, international bodies such as the World Bank and OPEC and the governments concerned, to contribute to the preparation of up to date statistics of current energy consumption and levels of dependence on external sources of supply, for all the ACP States;

11. Draws attention to the need for energy information centres in developing countries, and for the establishment of an international energy data bank;

12. Calls upon the Community and its Member States to contribute effectively to the extension of an approptriate information network on alternative sources of energy in order to increase public opinion awareness of potential economic and other risks in the use of certain techniques and types of equipment available to developing countries;

13. Sees, as a prerequisite for harmonious economic development, the need to elaborate energy strategies based on accurate estimates of energy supply and demand, and maintains that the European Community should, upon request from ACP States, provide assistance with the drawing up of energy inventories;

14. Regrests that no appropriations have been entered against Article 706 of the General Budget of the European Communities for 1982 to finance the preparation of energy inventories;

15. Calls on the governments of the ACP States to specify the energy projects required by their respective countries for the next decade with particular attention to the possibility of regional cooperation in harnessing different forms of power;

16. Notes with interest the statement in the Programme of Action of the Belgian presidency presented on 21st January 1982 to the European Parliament in Strasbourg to the effect that the Community will need to pursue during the first half of 1982 the examination undertaken after the UN Conference on New and Renewable Sources of Energy (Nairobi, 10 - 21 August 1981) of problems posed by cooperation in the field of energy with developing countries;

17. Insists on a positive Community response to the UN Conference on New and Renewable Sources of Energy, and recognises that this would require the provision of adequate funds through the General Budget of the European Communities;

18. Feels that the underlying principle behind ACP-EEC energy cooperation should be the reduction of dependence on external sources of supply through the optimal exploitation of the ACP's own energy resources;

19. Insists on the energy component being included for consideration in every project submitted under Lomé II, as such a measure would make programme designers conscious of both energy production and energy saving potential, and enable them to provide for corresponding measures in the context of the programme;

20. Stresses the importance of energy production potential being fully utilised, wherever possible, in all projects assisted by the EDF;

21. Believes that the highest priority should be given to the full utilisation of new and renewable energy sources, hydroelectricity and the exploration and exploitation of energy-producing mineral resources;

22. With regard to new and renewable energy sources,

(i) endorses the Programme of Action adopted at the Nairobi Conference (10 - 21 August 1981),

(ii) maintains that the problem of meeting energy needs in rural areas is of great urgency, and feels that small-scale projects using solar energy, biomass, windpower and peat, as well as micro-hydroelectricity, can play a particularly useful role in this respect,

(iii) calls on non-governmental organisations to make full use of the energy sources referred to in (ii) supra in their projects,

(iv) stresses the importance of decentralising, to the greatest possible extent, energy production, with the emphasis being given to rural energy requirements and the development of appropriate technologies;

(v) sees the need to develop large-scale reforestation programmes with selected fast-growing tree varieties,

(vi) believes that certain new and renewable energy techniques, notably solar energy, biomass, geothermal energy and peat, can also be used in large-scale projects where these would be appropriate, particularly in urban areas and for heavier industrial use;

23. With regard to hydroelectricity,

(i) stresses the value of small-scale projects, situated where possible near the points of consumption, which could be integrated with agricultural, stock-raising, piscicultural, forestry or drinking-water projects,

(ii) recognizes the important contribution of large-scale hydoelectric projects while being aware of the possible economic and ecological repercussions of such schemes; insists, therefore, on detailed studies being carried out, before taking the final decision, on the effects of major dams on all aspects of the environment, and on adequate measures being taken to deal with negative socio-economic or environmental effects;

24. With regard to energy-producing minerals, acknowledges that many ACP countries have not been subject to intensive geological surveys, and calls for full use to be made of the relevant provisions of the Convention of Lomé II;

25. Sees the need, where large scale energy production schemes are envisaged, for regional cooperation on the widest possible scale;

26. Recommends, in order that energy be utilized in the most effective rational and economic manner, that energy saving campaigns be carried out both in EEC and ACP countries, and in this connection stresses the need to adopt life styles and policies less wasteful of energy;

27. Stresses the importance of using energy to maximum efficiency at all levels, and in this respect draws attention to the possible contribution to domestic energy efficiency that can be made by well-designed domestic appliances and equipment, including appropriate solid-fuel cookers;

28. Conscious of the fact that the transfer of certain types of technology involving extensive use of energy has in certain cases caused extensive damage both to the industrial and agricultural sector of ACP countries, recommends that appropriate technologies more adaptable to the needs of ACP countries be adopted;

29. Calls for Community assistance with the development of suitable technology for both production and utilisation of energy in developing countries, particularly in research centres in ACP States; in this respect believes that a Community contribution could be made

- through the provision of assistance for research and development being undertaken in the ACP States,
- through the Joint Research Centre
- through appropriate indirect action research programmes,
- through Community cooperation with other bodies, including for example the International Energy Agency and non-governmental organizations, on R.and D. projects of use to ACP countries;

30. Calls for more efficient use to be made of draught animal power which would involve the teaching of improved techniques at local level;

31. Believes that the Convention of Lomé can prove a useful vehicle for the transfer of suitable technology provided the will exists; calls on the Community institutions, its Member States, its educational bodies and European industries to cooperate with regard to the transfer of suitable technology through joint ventures and other forms of industrial cooperation between the EEC and the ACP;

32. Emphasizes the importance of training at all levels, management, operative and consumer, and recognizes that the Community can fulfil a useful function in this respect, repeats the demand for the establishment, as a matter of urgency, of a management training college to be sited in an ACP State with courses specially structured to meet the vital needs of the economies of the developing world, and calls upon the Commission to present a detailed proposal with a programme for action to the next ACP-EEC Consultative Assembly;

33. Calls for even greater use to be made of co-financing in the future, believing that the Community can thereby act as a catalyst for obtaining greatly increased financial assistance for energy-related projects in ACP States;

34. Feels that a problem so vast as that posed by the enrgy crisis must be faced at world level, and hopes for the rapid opening of global negotiations that would include, inter alia, discussions on energy issues;

35. Sees the need for a well-endowed fund, managed at inernational level, be it in the form of an Energy Affiliate of the World Bank or a Special Fund for energy, to assist the developing countries to face the problems resulting from the world energy situation; calls on the European Community to strive, at the highest international level, for the creation of such a fund, and to subscribe generously to it in the event of its being set up;

36. Believes that the oil exporting countries can play a greater role in assisting energy-importing developing countries through the provision both of additional funds and of petroleum products at concessional rates; in this regard pays tribute to the exemplary action of certain oil producing countries;

37. Recognizes the particular difficulties facing the least developed countries, and hopes that the special provisions of the Convention designed to assist them be fully utilised and that their specific difficulties, notably lack of capital resources, be taken into account when approving energy-related projects from these countries; calls for special measures to be implemented and additional finance to be provided as a follow-up to the Paris Conference[1];

38. Requests the Commission of the European Communities to prepare concrete proposals, reflecting the views expressed in this resolution, in time for the meeting of the ACP-EEC Consultative Assembly in September 1982;

39. Requests that consideration be given in the context of the future negotiations of any successor agreement to the ACP/EEC Lomé II Convention for a more extensive and closer cooperation between the ACP and EEC in the field of energy;

40. Requests that this resolution and the report drawn up by H.E. Mr N.K. Siddig be forwarded to the ACP-EEC Council of Ministers, the ACP Committee of Ambassadors and the Council and Commission of the European Communities.

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[1] UN Conference on the Least Developed Countries, Paris, September 1981

B

EXPLANATORY STATEMENT

I. Introduction

1. Of the ACP States only 6 are oil producing countries; the remaining 55 have to rely almost totally on imported oil to meet their basic energy needs. Many cannot afford to purchase badly needed fuel supplies, and high costs have caused severe inflation and balance-of-payments problems. According to IMF, balance-of-payments deficits of oil-importing countries increased from $7 billion in 1970 to an expected $97 billion in 1981. The high price that must be paid for oil, diverts scarce national resources that could be used for development.

Even though the consumption of hydrocarbon fuels by ACP countries accounts for but a fraction of that of the EEC members, the impact of the high cost of imported fuel on which they are vitally dependent - on their weak economies - is far greater than in the EEC nations; the scope for conservation and saving of fuel is extremely limited.

2. ACP States are more dependent on oil for their energy requirements than the EEC States. In the case of some ACP States, oil accounts for more than 90 per cent of their energy consumption. Coal could make an important substitute of oil for some ACP States; the exploitation and extraction of coal requires, however, substantial investments and technological know-how and high oil prices will constitute the sole inducement for developing countries to utilize this source of energy.

Nuclear energy is not predicted to play any substantial role in ACP States for the near future.

3. In the ACP Group, we are faced with two energy crises:

(a) a commercial energy crisis as is the case with EEC States;

(b) an even graver crisis stemming from the inefficient and disastrous use of non-commercial energy which has created a number of specific problems such as deforestation and desertification.

- In the medium and long term the main impact of a large utilization of new sources of energy (e.g. solar) in the ACP States will be the achievement of the following two main objectives:

  (a) to facilitate further development of these countries in the field of living conditions, food production, development of labour skills and employment;

  (b) to reduce the dependence of these countries on imported energy and enable them to attain the maximum possible degree of energy self-sufficiency.

- ACP countries should not become just consumers of the new sources of energy but should be involved at all stages of its development and use. National plans should include development of indigenous sources of energy.

4. The level of energy consumption (see Annex V) differs considerably among the ACP, depending to a great extent on the level and nature of economic development in each state. While figures are available only for commercial energy consumption, it should be noted that, as stated above, in most ACP States non commercial energy plays an important role, particularly for cooking, heating and small-scale craft production, and in certain ACP States non commercial energy, particularly wood and charcoal, can account for up to half the value of commercial energy consumption. Increased population pressure and diminishing areas of woodland, coupled with the disastrous effects of deforestation which gives rise to soil erosion and desertification, means that dependence on traditional sources cannot continue to increase. In recent years increasingly greater numbers of non commercial energy users have had to turn to commercial fuels.

5. Energy consumption varies considerably from one ACP state to another. According to figures on energy consumption prepared by the Commission in 1980, 18 ACP States had k.c.e. (kilograms coal equivalent) consumption ratings per dollar of gdp of 0.5 k.c.e. and above, while 9 ACP States had ratings of less than 0.25 k.c.e. per dollar.

6. Energy consumption per head in the ACP is on average 40 times less than the per capita consumption in the European Community and 100 times less than the per capita consumption in the United States of America. The economic

growth for which all developing countries strive will inevitably lead to a greatly increased level of energy consumption, consequently aggravating the balance of payments situation of the oil importing developing countries. While the very close link that has hitherto existed between economic growth and increased energy consumption has, in certain cases, been broken, this has been made possible only by massive capital investment in technological research, plant and equipment. The outlook for the ACP, with severely limited capital resources, is particularly unfavourable. Nevertheless if economic growth is to be achieved, then suitable solutions to the energy problem must be found.

7. Even where commercial energy consumption is low, the problem of dependency on hydrocarbons can be particularly worrying, in that the small amounts involved are required for vital services such as transport and power generation, without which the economic, social and administrative structures of the countries concerned would suffer considerable disruption.

8. The Commission of the European Communities has produced a table showing energy use and the impact of fuel imports in ACP economies (see Annex I). A careful examination of this table brings home graphically the serious situation facing the overwhelming majority of ACP States.

II. Achievements of ACP-EEC cooperation in the energy sector:

9. Though energy cooperation was not specifically referred to in the earlier agreements between the European Community and associated developing countries, energy projects in associated states received financial assistance from the Community from the time of the 1st EDF (1958-1962).

10. In the 1st EDF 2 energy projects, an electricity network in the Comores (340,000 UA) and a thermo-electricity power station in Niger (360,000 UA) were assisted.

11. Under the Convention of Yaoundé I (2nd EDF - 1965-1968) energy projects financed under the heading 'financial and technical cooperation' showed an important increase, 10 projects being assisted at a total cost of 24m UA. It should be noted that, as in the case of the Niger power station financed under the 1st EDF, one of the projects assisted under the 2nd fund concerned the recovery of energy from biomass, particularly agro-industrial waste. Under the 2nd EDF projects for the transportation and distribution of electricity amounted to 93% of the total fund devoted to the energy sector.

12. The Convention of Yaoundé II (3rd EDF - 1969-1974) saw a decrease in both the number of energy projects and the volume of assistance to this sector. This Convention was negotiated during the years immediately prior to the 1973 energy crisis, a period when energy was at its cheapest and most available. The pressing need for investment in alternative energy sources to hydrocarbons was not yet apparent, and few governments, either in the Community

or in the associated states, gave a high priority to increasing energy efficiency. Thus the 3rd EDF provided 15m UA for 9 projects in the energy sector, 96% of these funds being devoted to the transport and distribution of electricity. It was during this period that regional cooperation was invoked for the first time in connection with the financing of an energy cooperation project, namely the Ruzizi II power station which will provide electricity for Burundi, Rwanda and Zaïre.

13. The Convention of Lomé I (4th EDF - 1975-1980) was negotiated during the immediate aftermath of the 1973 energy crisis. Even though the Convention did not contain specific references to energy cooperation, nevertheless energy projects received much greater prominence due to greatly increased energy costs and the preoccupation on the part of most ACP governments to achieve a higher level of energy self-sufficiency. Understandably a lower proportion of funds were devoted to thermal power stations under Lomé I than previously. Here 69% of funds devoted to energy projects went to hydro-electric schemes, as opposed to less than 3% for hydroelectricity under Yaoundé II. Encouragement was given by the Commission to the promotion of alternative energy sources, including solar energy, biomass, geothermal energy and small-scale hydroelectric power projects, and 26 such projects were financed under Lomé I at a cost of some 25m EUA.

14. One of the most significant features of Lomé I was the development of co-financing. Some 93% of the funds under the 4th EDF devoted to projects in which the energy component predominated involved co-financing. The Community's contribution to co-financed projects amounted to some 380m EUA, which helped to generate overall funding in excess of 1000m EUA, the main participants with the Community in co-financing were Arab funds and the International Bank for Reconstruction and Development. The Commission has estimated that the total cost of financing energy projects under Lomé I will amount to some 612m EUA. The full list of energy projects assisted between 1958 and 1980 is given in Table II. For a breakdown by sector on Community assistance in the energy field see Table III.

III. The possibilities offered by Lomé II for cooperation in the energy sector

15. Unlike its predecessors, specific sections of the Convention of Lomé II are devoted to cooperation in the energy sector. Article 76 of the Convention deals in particular with energy cooperation. Its aim is to encourage the ACP States to achieve the greatest possible self-sufficiency in energy through the development of their conventional and new sources of energy.

16. In Article 76 the Community and the ACP States recognise the mutual benefits that can be derived from cooperation in the field of energy, and specific areas for cooperation are listed.

(a) The Convention makes particular reference to the preparation of inventories on energy resources and demand, with adequate attention being paid to non-commerical energy demand.

Though energy forecasting has proved to be highly uncertain over the last two decades, it is nevertheless particularly important for developing countries to have resources and demand balance sheets so that priorities and options for development, including investment requirements, can be determined.

In most ACP countries a great deal of work remains to be done in this sector, and here the Community can play a valuable role both with technical assistance and financial help. Energy balance sheets can be of use both in the choice of sectors for development and in vetting the advisability of individual projects. In several ACP States studies and reports on aspects of energy resources[1] and requirements have been made. The Community could usefully help in collating these studies and including them into a global energy resources and demand inventory. The drawing up of energy inventories is obviously closely related to mineral and energy prospection.

(b) One of the most significant aspects of assistance under Lomé II is regarding the development and implementation of alternative energy strategies in programmes and projects. The ACP countries are particularly suitable areas for the development of solar, wind, hydroelectric and geothermal energy. Most ACP States receive considerably more solar radiation than does the European Community. Furthermore, in many ACP countries low population density increases the attraction of small-scale solar, wind, geothermal or micro-hydroelectric projects. A few coastal ACP States may, in the future, be able to benefit from energy derived from the temperature differences between surface and deep water (thermal gradients) as well as from wave and tidal energy. It is generally believed that small-scale installations using new energy sources will, with the exception of hydroelectric schemes, prove more profitable than major installations, and even where hydroelectric power is concerned, micro installations can be particularly valuable in developing countries with scattered populations. The importance of energy from biomass has been recognised by several ACP governments, and this constituted a particuarly fruitful area for future cooperation.

(c) The Convention of Lomé II also provides for the possibility of assistance for the development of investment potential for the exploration and development of regional energy sources as well as national sources, and envisages help with the development of sites of exceptional energy production enabling the establishment of energy intensive industry. In this regard the regional dimension of assistance is important. This is not new, and could be particularly

[1] See Annex II

significant in the case of hydro-electric schemes and the utilisation, for example, of geothermal sources. Up to now, insufficient attention has been paid to the energy content of industrial development. Article 76 specifically mentions assistance for the establishment of energy intensive industries on suitable sites. This provision could be of particular interest for ACP States with reserves of hydrocarbons or coal, or abundant hydroelectric resources.

(d) Article 76 recognises the importance of management and the control of energy resources, without which their full development potential cannot be harnessed. This aspect involves training in managerial and technical skills.

(e) The establishment of a rural energy programme with emphasis on rural energy technologies and energy planning is also referred to. The decentralization of energy production, corresponding to the real consumption needs of developing countries, is particularly welcome. In this regard it is to be hoped that due attention will be paid to the need for assisting rural communities with their transition to participation in the commercial energy market, which becomes increasingly necessary as traditional fuel resources, mainly wood and derivatives, are depleted. Rural energy programmes can also play a major role in the alleviation of hunger in the developing world, both with regard to the development of more intensive agricultural techniques and the establishment of small-scale rural-based industries.

(f) One of the most important aspects of Article 76 is the provision whereby assistance can be afforded to the promotion of research and the adaptation and dissemination of appropriate technology as well as the training needed to form production and maintenance staff for energy production and distribution. Reference has already been made to management training, but the most pressing need for training comes at the technical operative level.

The provision of suitable technology in the energy sector would be of particular value to the ACP States and here the Community can play a major role. There are, of course, difficulties connected with the transfer of technology. We realize that, in the the Community, almost all technology is, effectively, the physical and intellectual property of private companies and, in some instances, individuals, rather than of the state. In the case of private companies, the profit motive may be the paramount consideration. This is why a system of guarantees, in the form of patents and licences,

has been developed to ensure property rights. These guarantees would have to be maintained in the case of technical transfer, and the legal and economic difficulties resulting therefrom would have to be faced. This is, however, not an insurmountable problem. The Convention does not mention the means whereby technology transfer could take place, nor does it provide any indication of how the results of research can be adapted or disseminated. Yet the intention, in principle, has been stated. This, at least, could make a start.

(g) Article 76 provides for assistance with the manufacturing in the ACP States of equipment for the production and distribution of energy as well as the application of energy saving techniques. The problems connected with technological transfer referred to in the preceding paragraph also apply here. The intention has been clearly stated in the Convention. It is now up to the ACP States concerned and the Community to decide on the modalities. Certain energy production and distribution equipment, designed specifically for use in developing countries, could form the basis of valuable industrial development as the market for such goods is growing. Furthermore, ACP initiatives and interventions in this field would be liable for Community assistance and need not come up against patent or licensing restrictions.

The application of energy saving techniques is to be particularly welcomed. The cliché that the cheapest additional energy is energy saved has a basis in fact. It seems probable that most of the ACP countries with energy consumption over 0.5 kce per $ of GDP could save up to 10% of energy without major new investment through the more rational use of energy and the use of more efficient production, distribution and consumption techniques.

(h) Lomé II provides help for the implementation of measures that would minimise the negative impact of energy production on the environment as well as promoting environmentally positive projects. The harmful effects resulting from large-scale dam construction has been noted in several ACP countries, and a greater sensitivity to the environmental consequences of energy production is now apparent both in the developing and developed world. It is of the greatest importance that detailed studies be carried out, before taking final decisions, on the effects of major dams on all aspects of the environment. Depletion of natural resources has led to the progressive abandonment of certain traditional fuels which in turn has given rise to increased demand for commercial energy sources. Of the "new" energy sources, certain biomass techniques can, in the long run, be environmentally harmful, and the implementation of measures to minimise the negative impact of energy production is to be welcomed.

(i) Article 76 specifically refers to the possibility of assistance for the conservation of existing and future energy sources of ACP States, whether conventional or non-conventional.

17. All the programmes and projects undertaken in the context of Article 76 are to be implemented in accordance with Title VII, financial and technical cooperation. In the case of research and experimental projects as well as exploration and development projects of mutual interest, the resources provided for under the financial and technical cooperation may be supplemented by other Community financial resources and through co-financing. Through co-financing, Community funds can act as a catalyst, bringing in considerably greater funding from external sources. It is to be hoped that the possibilities of co-financing in the energy sector will be fully utilised under Lomé II.

18. Three articles in the Convention deal with the development of the mining and energy potential of the ACP States. These are Articles 57, 58 and 59.

19. Article 57 expresses the Community's willingness to give technical and financial assistance to help the exploitation of the ACP States' mining and energy potential.

20. Article 58 states that, at the request of one or more ACP States, the Community will carry out technical assistance to strengthen the scientific and technical capacity of the ACP States concerned in the field of geology and mining, and provides for the possibility of Community technical and financial assistance to the establishment of national or regional exploration funds in ACP States. This article also provides for Community assistance in the form of risk capital, possibly in conjunction with contributions from other sources, where research and investment preparatory to the launching of mining and energy projects is concerned.

21. Article 59 empowers the EIB to commit its own resources on a case by case basis beyond the amounts fixed in Article 95 for mining investment projects and energy investment projects recognised by the ACP State concerned and by the Community as being of mutual interest.

22. The provisions of Articles 57, 58, 59 and 76 set out a broad framework in which the Community can act. It could be said that, under Lomé II, energy is given its rightful place in ACP/EEC cooperation. The funds are, however, limited and it remains to hope that ACP States will be in a position to take full advantage of the possibilities offered, given that resources devoted to energy means less funding for other vital sectors.

IV. Cooperation in the energy sector over and above the provisions of Lomé II

23. Your rapporteur sees this sector as of particular importance, and envisages its amplification following discussions in the working group. Initially the following possibilities for going beyond the strict provisions of Lomé II have been envisaged :

(a) Increased co-financing, including Community co-financing with other international bodies and with individual countries

Reference is made to co-financing in Article 76(2) of the Convention. Your rapporteur feels that the possibility of the provisions of other Community funds outside the strict framework of the EDF for use in the energy field should be considered. The positive effects of such funds could be multiplied when used in conjunction with funds from other sources, including recycled oil revenues. The increased energy independence of the ACP States is so much in the interest of the Community that special assistance in this regard could be seen as being mutually beneficial to both partners.

(b) Cooperation between European and ACP industries

This could prove to be one of the most effective means of transferring technology, know-how and skills to the ACP nations. One possible approach would be the creation of joint ventures, whereby European and ACP firms cooperate in the establishment of enterprises in ACP countries. Such enterprises could be in the field of energy production and distribution and, perhaps even more useful, engaged in the manufacturing of energy production and distrbution equipment. The potential for the production of equipment for the harnessing of new energy sources, particularly biomass, solar and wind energy, is considerable ..

(c) The development of suitable technology for energy production and the rational utilisation of energy in third-world nations need not only be fostered by EDF funds such as is provided for in Article 76. Here once more there is room for assistance from the non-governmental sector, with the encouragement of the governments of the Member States and the Community authorities.

(d) Your rapporteur believes that this working group should emphasise the importance of enhancing cooperation between developing countries, particularly in the ACP framework, in the energy sector. Developments in energy lend themselves particularly to regional solutions, as has been seen from projects financed under previous EDFs. The importance of regional cooperation, quite outside the EDF context, must be stressed

and every encouragement, at political as well as at economic level, given to such developments.

(e) In the last two general budgets of the European Communities, appropriations were entered under Chapter 32 (expenditure under the energy policy) to cover Community contribution to the drawing up of energy balance sheets in developing countries, outside the framework of the EDF. These sums, admittedly inadequate given the size of the task, amounted to 350,000 EUA in 1980 and 1m EUA in 1981. In the preliminary draft budget for 1982, the Commission proposed 1.3m ECU in payment and commitment appropriations entered, on this occasion, under Chapter 70 (Article 706). This was replaced by a token entry by the Council in its draft budget. On the initiative of the Committee on Energy and Research the Committee on Budgets proposed an amendment to re-enter appropriations against Article 706, but this amendment failed to obtain the required number of votes in the budgetary session of Parliament in November 1981. Thus this item remains without appropriations. It is to be hoped that finance can be provided for this action by other means, such as by internal transfer, during the course of 1982. As stated in the budget this article was specifically intended for the implementation of activities and investigations for the drawing up of energy balance sheets, the organisation of information meetings, to cover the costs of organising and attending training courses, and the payment of experts and various associated services. The need for energy inventories has already been considered. This small action could make a useful contribution, particularly with regard the diffusion of information and the training of experts. Your rapporteur hopes that these funds will be increased in future budgets.

(f) Article 76(f) of the Convention refers to the promotion of energy research. Your rapporteur feels that much can be done in this respect outside the framework of the EDF. The Community can do a great deal to encourage research in the energy sector of direct use to developing countries. Here the Community's Joint Research Centre could play a valuable role. The JRC already carries out work into solar energy, and this can be extended to make it more relevant to the needs of ACP countries. The JRC's role need not be limited to solar energy, though its present emphasis on nuclear power is not really appropriate to the needs of most ACP countries. Independently of the JRC, the Community is financing a considerable number of "indirect action research projects". These are projects commissioned by the Community and administered by the Commission's services, the research work being carried out under contract by research institutions in the Member States. Your rapporteur feels that it might be worth investigating the possibility of extending this type of research to projects of interest to developing countries, which could possibly be carried out in the ACP. Similarly, it would be worth investigating if the ACP could benefit from the energy research programmes being carried out in the framework of the International Energy Agency set up under the OECD. The

Community as such, and 9 of its 10 Member States, are members of the IEA. It is to be hoped that they could use their influence to make that body more aware of the needs of developing countries. Finally, the possibility of undertaking COST research programmes (research programmes in which the Community and other countries participate jointly) with ACP countries in the energy sector should be investigated.

V. The importance of energy cooperation on a world-wide scale

24. The energy question must be considered at a global level. Both producers and consumers of energy are dependent on internationally-fixed market prices before national prices can be determined directly by price control and indirectly by fiscal measures. Many of the difficulties facing the developing countries are due, in great part, to international trading patterns and disadvantageous terms of trade whereby many raw materials, other than energy sources, are underpriced in relation to manufactured goods and hydrocarbons. Since the mid 1970s, starting with the inconclusive Conference on International Economic Cooperation held in Paris in 1977 which initiated the so-called "North-South Dialogue", a series of attempts have been made to come to grips with these interrelated problems at world level.

25. During the course of 1981 three important international meetings have taken place which should be considered in this context, namely:

- The United Nations Conference on New and Renewable Energy Sources (Nairobi, 10-21 August 1981

- The United Nations Conference on the Least Developed Countries (Paris, 1-14 September 1981),
  and

- The International Meeting on Cooperation and Development (Cancun, 22-23 October 1981).

26. (i) The U.N. Conference on New and Renewable Energy Sources is of particular interest and relevance to the working group. This conference was attended by over 4000 participants from 141 countries, UN specialised agencies, intergovernmental and non-governmental organisations. The conference adopted an Action Programme which was both political and technical in character and included a proposed framework for national action. It now remains to be seen to what extent this programme will be implemented. This is all the more questionable as no positive decisions were taken with regard to the mobilisation of the financial resources required. The Action Programme mentioned the provision of additional funds through U.N. agencies such as the U.N.D.P., the Development Fund for the exploration of natural resources, the interim financial arrangement for science and technology and the U.N.D.P., though the U.S. government made clear its hostility to any such arrangements

The conference based its work on the premise that supplies of conventional fossil fuels will not last forever, and that new, alternative sources of energy must be developed. The Programme of Action which it adopted recommended a series of measures in the area of hydropower, fuelwood and charcoal, biomass, solar energy, geothermal energy, wind energy, oil shale and tar sands, ocean energy, draught animal power and peat. It gave particular attention to the energy needs of rural populations, with special reference to their domestic energy requirements, including diminishing reserves of fuelwood.

Priority areas included large-scale forestation programmes with selected and tested tree varities aimed at increasing fivefold the annual rate of fuelwood planting by the year 2000, and the use of improved techniques for using draft animal power, including husbandry practices.

The programme also considered the need to meet urban and industrial requirements, particularly those in the developing countries.

The programme recognised that the availability of adequate information was a prerequisite for sound decision-making, and stressed the need for the establishment of energy information centres which could in time be linked up to become a global information network (data bank).

In addition to the Programme of Action, the conference adopted several resolutions on specific energy-related problems.

An alternative energy exhibition was organised along with the Conference, showing techniques and equipment for the exploitation of alternative energy resources. Of particular note were examples of more efficient solid-fuel burning ovens which could be produced at reasonable cost for use in developing countries. Your rapporteur feels that this type of initiative is the sort of small-scale, unpretentious measure that could, in the long term, make a valuable contribution to energy economy at local level. It is to be hoped that the Community could assist initiatives of this nature and encourage the dissemination of such appropriate equipment in developing countries.

The Working Group in general endorses the conclusions of the conference, as did the European Community and its Member States. The Lomé Convention could constitute a valuable instrument for putting into practice the measures enunciated in the Action Programme. The Commission is accordingly requested to act accordingly.

(ii) The U.N. Conference on the Least Developed Countries dealt only with a limited number of developing countries, though these were the poorest and included 21 ACP States. One section of the Substantial New Programme of Action adopted by the Conference was devoted to Natural Resources and Energy. The conference viewed with concern the energy problems of the LLDCs and expressed the view that a major effort would be needed to increase domestic energy supplies in order to meet the increasing demands imposed by the development process. It further stated that "for this purpose the least developed

countries may wish to consider integrating a comprehensive energy strategy into their over-all development plans. To promote efficient allocation and development of energy resources, such an approach would incorporate sound domestic energy policies in accordance with their own circumstances. In this context, transfer, adaptation and application of technology, conservation, reforestation in desertified areas and maintenance of existing forests are also important "[1]. The conference also endorsed the Nairobi Programme of Action on New and Renewable Sources of Energy regarding the priority action to be accorded to the least developed countries taking into consideration the rapid depletion of traditional energy sources such as fuelwood, charcoal and animal waste, and referred to the resulting grave consequences for the environment. The section on Energy and Raw Materials concluded with the demand that "all developed countries, developing countries in a position to do so, multilateral institutions and other sources should provide financial and technical assistance for the research, exploration and development of energy resources in the least developed countries"[1].

The Working Group acknowledges the gravity of the energy situation in the least developed countries, and points out that special provisions to assist them have been written into the Convention of Lomé II. Furthermore it calls on the Commission to do all in its power to ensure that these special provisions are fully utilised, and requests that the specific difficulties of the LLDCs, notably lack of capital resources, be taken into account when approving energy-related projects from these countries.

(iii) The International Meeting on Cooperation and Development, held in Cancún (Mexico) on 22-23 October 1981, was attended by Heads of State or Government from eight industrialised and 14 developing countries. Three EEC Member States, France, Germany and the United Kingdom, were represented, though the Community per se had not been invited to participate.

One of the principle subjects of discussion was the creation of an energy affiliate of the World Bank with the task of assisting developing countries with oil-related problems. At Cancún the three Member States present all came out in favour of such an initiative, though the President of the United States of America was opposed to the setting up of a separate energy affiliate.

In its final document the need to ensure an organised transition from dependence on hydrocarbons to other sources of energy is mentioned, as is the desire for a world energy plan. The section dealing with additional financing of energy is rather imprecise. It appears that the Cancún meeting did not agree on the creation of an energy subsidiary of the World Bank, but rather took the view that a special section of the bank could deal with energy. Levels of financing were not referred to in the final document.

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[1] Report of the UN Conference on the Least Developed Countries
UN Document A/Conf. 104/22 of 2.10.1981, page 16

This situation is less than satisfactory and the Working Group sees the need for a well-endowed fund, managed at international level, that would help developing countries to face the problems resulting from the world energy situation. The European Community and its Member States are accordingly urged to strive, at the highest international political level, for the creation of an energy affiliate or any other form of additional financing to assist developing countries, and to subscribe generously to such an additional financing fund in the event of its being set up.

VI. Conclusions

27. The Working Group on Energy emphasises the importance of making full use of all the provisions provided under Lomé II. It is up to both the ACP States and the Community to utilise the possibilities which now exist, particularly under Article 76.

28. The Working Group feels very strongly that the energy component must be included for consideration in every project submitted for approval under the Lomé Convention. It is almost impossible to imagine a project that would not consume energy, and many could be made more energy-efficient with more careful study. Furthermore, potential for energy production, particularly on a small scale, exists in many projects, either through the combustion of waste or the use of flowing water. The obligation to consider the energy component in every project submitted would help to make proposers and designers of projects more conscious of both the energy production potential and the energy saving potential of their projects. The Commission could provide a consultancy service to supply advice, as well as vetting the energy component of proposed projects. Measures such as this would cost little to implement and could contribute appreciably to the more rational use of energy.

29. Finally, it must once again be stressed that the increased energy independence of the ACP States is both to their own advantage and to the advantage of the European Community. Less energy imported by the ACP means more energy available on the world market for other consumers, including the Community. European funds devoted to alleviating the ACP States' energy requirements would bring a double benefit to Europe, by both reducing world demand for scarce energy and by strengthening the economies of ACP countries which, through economic interdependence, would operate in the interest of Europe as well as of the ACP.

ENERGY IN ACP ECONOMIES

	ENERGY USE IN k.c.e.1979 (kilogrammes of coal equivalent)				FUEL IMPORTS IMPACT (1973-1975-1978 *)					Oil as % of total commercial energy consumption
	Per capita commercial energy consumption			Consumption in terms of k.c.e. per $ of GDP	1973-1977 import growth (1973 = 100)		Fuel net imports as % of total exports			
	0 100	100 400	over 400		Fuel	all imports	1973	1975	1978 *	1979
BAHAMAS			5.674	1.18	597	399	6.5	2.9	54(77)	100
BARBADOS			1.104	0.44	277	162	11.5	20.6	24(77)	96
BENIN	57			0.25	225(73-75)	143	14.2	35.8	36(74)	95
BOTSWANA					416	175	8.7	14.8	16(77)	-
BURUNDI	13			0.09	522(73-76)	186	6.3	14.5	9(76)	76
CAMEROON		104		0.17	313	222	5.9	13.0	9	82
CAPE VERDE		150		-	-	-	-	-	-	32
CENTRAL AFRICAN REP.	41			0.14	124	123	0.8	1.2	1	92
CHAD	22			0.17	116(73-75)	160	18.2	31.0	31(75)	100
COMORES	58			0.28	283	110	-	22.0	31(77)	100
CONGO		190		0.25	(Net exporter)					97
IVORY COAST		224		0.19	608	245	1.5	7.6	10	99
DJIBOUTI			784	-		-	-	29.0	30(76)	100

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ENERGY IN ACP ECCNOMIES

	ENERGY USE IN k.c.e. 1979 (kilogrammes of coal equivalent)				FUEL IMPORTS IMPACT (1973-1975-1978 *)					Oil as % of tctal ccmmercial energy ccnsumption
	Per capita ccmmercial			Consumption in terms of k.c.e. per $ of GDP	1973-1977		Fuel net imports as % of total exports			
	0 100	100 400	over 400		Fuel	all imports	1973	1975	1978 *	1979
DCMINICA		190		0.57(76)	203	135	-	12.0	16(77)	87
ETHIOPIA	16			0.13	266(73-76)	166	7.8	17.9	20	90
FIJI			460	0.38	324	151	12.2	17.0	20(77)	100
GABON			2.055	0.37	(N e t e x p o r t e r)					72
GAMBIA		118		0.12	310(73-76)	234	9.2	8.9	13(76)	100
GHANA		161		0.02	321	193	6.4	15.0	19(77)	71
GRENADA		194		0.38(77)	-	-	17.3	-	-	100
GUINEA	85			0.01	-	-	-	-	-	98
GUINEA BIS.	71					75	0	53	34(77)	100
EQG.GUINEA	87			0.75(77)	-	-	-	-		100
GUYANA			1.058	1.76	277	180	16.6	15.4	25(77)	100
UPPER VOLTA	23			0.16	319	265	21.5	30.7	32(77)	100
JAMAICA			1.297	1.11	347	130	16.4	26.0	14	95

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ENERGY IN ACP ECONOMIES

	ENERGY USE IN k.c.e. 1979 (kilogrammes of coal equivalent)				FUEL IMPORTS IMPACT (1973-1975-1978 *)					Oil as % of total commercial energy consumption
	Per capita commercial energy consumption			Consumption in terms of k.c.e. per $ of GDP	1973-1977 import growth (1973 = 100)		Fuel net imports as % of total exports			
	0 - 100	100 - 400	over		Fuel	all imports	1973	1975	1978 *	1979
KENYA		148		0.32	126	219	7.4	32.2	30	90
LIBERIA		385		0.73	329(73-75)	171	4.5	12.3	17	95
MADAGASCAR	83			0.25	515(73-75)	179	4.5	16.1	16	95
MALAWI	54			0.24	238	163	10.6	17.5	22	71
MALI	83			0.17	197(73-75)	119	21.0	25.4	25(76)	97
MAURITIUS		375		0.35	260(73-76)	211	8.6	10.9	86(76)	98
MAURITANIA		176		0.51	197(73-76)	143	3.9	6.6	-	98
NIGER	44			0.13	180(73-76)	148	13.2	14.0	11(76)	97
NIGERIA	78			0.27	(e x p o r t e r)					78
UGANDA	27			0.04	8255(73-76)	162	0.1	0.6	12.5	85
PAPUA NEW GUINEA		298		0.88	419(73-76)	149	4.8	9.0	13(76)	96
RWANDA	20			0.10	423(73-76)	336	8.2	16.1	118(76)	76
SOLOMON ISL.		199		0.52	291	177	9.8	12.2	0	100

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ENERGY IN ACP ECONOMIES

	ENERGY USE IN k.c.e. 1979 (kilogrammes of ccal equivalent)				FUEL IMPORTS IMPACT (1973-1975-1978 *)					Oil as % of total commercial energy consumption
	Per capita commercial energy consumption			Consumption in terms of k.c.e. per $ of GDP	1973-1977 import growth (1973 = 100)		Fuel net imports as % of total exports			
	0 100	100 400	over 400		Fuel	all imports	1973	1975	1978 *	1979
W. SAMOA		250		0.40	392	191	16.8	42.6	24.9(77)	97
S. TOME		150		0.25	-	-	-	-	-	100
SENEGAL		252		0.56	87(73-76)	179	5.4	8.0	2.1(77)	100
SEYCHELLES			651	0.56	390	185	66.0	224.0	100	100
SIERRA LEONE	84			0.32	119(73-76)	97	5.2	17.0	10(76)	100
SOMALIA	80			0.48	216	211	8.5	10.7	14.7	100
SUDAN		128		2.01	90 (73-75)	200	5.3	4.6	24(77)	97
SURINAME			2638	1.35(77)	-	-	-	-	14.3(74)	81
SWAZILAND					261(73-76)	209	4.5	9.6	10.5(76)	-
TANZANIA	43			0.17	211(73-76)	127	6.4	16.6	17.8(76)	91
TOGO	95			0.25	393	283	8.5	10.3	12.8(77)	92
TONGA		168		0.41(75)	273	173	15.2	17.0	41	100
TRINIDAD			5043	1.40	(e x p o r t e r)					39

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ENERGY IN ACP ECONOMIES

	ENERGY USE IN k.c.e. 1979 (kilogrammes of coal equivalent)				FUEL IMPORTS IMPACT (1973-1975-1978 *)					Oil as % of total commercial energy consumption
	Per capita commercial energy consumption			Consumption in terms of k.c.e. per $ of GDP	1973-1977 import growth (1973 = 100)		Fuel net imports as % of total exports			
	0 100	100 400	over 400		Fuel	all imports	1973	1975	1978 *	1979
ZAIRE	66			0.24	158(73-76)	98	5.1	10.0	net export	63
ZAMBIA			443	1.29	249(73-76)	174	4.4	15.5	11(77)	38

Sources: SOEC: ACP: Yearbook of Foreign Trade Statistics
.WORLD BANK: National Accounts
.UN : Yearbook of World Energy Statistics

ANNEX II

ENERGY RESOURCES OF ACP STATES

(rating codes : *** high - ** fair - * low)

	Oil	Hydro-electric	Coal	Geo-thermal	Schists	Ocean	Wind	Biomass	Other
BAHAMAS	*								
BARBADOS	*						**	***	
BENIN	**	**							
BOTSWANA	*	*	***				**		
BURUNDI	*	**		*			*	*	Peat **
CAMEROONS	***	***						**	
CENTRAL AFRICAN REPUBLIC	*	**							
CHAD	***	**		**			**	*	
COMORES	*	*		*		**	**		
CONGO	***	**							
IVORY COAST	**	**			**	**	*	**	
DJIBOUTI				***					
DOMINICA									
ETHIOPIA	*	***	**	***			**	**	
FIJI	*	***							
GABON	***	***							
GAMBIA	*								
GHANA	***	***						**	
GRENADA	**								
GUINEA KONAKRY	*	***							
GUINEA BISSAU	**	**						**	
EQU. GUINEA	*								
GUYANA	*	***						**	

ANNEX II

ENERGY RESOURCES OF ACP STATES

(rating codes : *** high - ** fair - * low)

	Oil	hydro-electric	Coal	Geo-thermal	Schists	Ocean	Wind	Biomass	Other
UPPER VOLTA	*	*						***	Peat **
JAMAICA	**	**						*	
KENYA	*	***		**			**		
LESOTHO		***							
LIBERIA	**	**							
MADAGASCAR	*	**		**	**			*	
MALAWI	*	**	**	**					
MALI	*	**				*		**	
MAURITIUS	*	*					**		
MAURITANIA	**						**	*	
NIGER	***	***	***					*	
NIGERIA	***	**	***	**					
UGANDA	*	***		*				**	
PAPUA NEW GUINEA	*	**		**				*	Methane ***
RWANDA	*	***							Peat **
SOLOMONS									
WESTERN SAMOA		***							
SAO TOME							**	**	
SENEGAL	**	*							
SEYCHELLES	*	*				**	**	**	
SIERRA LEONE	*	***							
SOMALIA	*	**	*	**	**	*	**	**	
SUDAN	***	*						**	
SURINAM	**	***							
SWAZILAND	*	*							

ANNEX II

ENERGY RESOURCES OF ACP STATES

(rating codes: *** high - ** fair - * low)

	Oil	Hydro-electric	Coal	Geo-thermal	Schists	Ocean	Wind	Biomass	Other
TANZANIA	**	**	**					*	
TOGO	*	**							
TONGA	*								
TRINIDAD	***								
TUVALU	*								
ZAIRE	***	***	**						Methane***
ZAMBIA	*	***	**	*			*	*	

ANNEX III

ENERGY PROJECTS

1958 - 1980

Country	Project	Type	000 ECU nat.proj.	000 ECU reg.proj.	000 ECU EEC total	000 ECU est.total cost
	Treaty of Rome					
	1st EDF					
Comores	Electrif. of Moroni and Mutsamudu	Constr.	340	-	340	340
Niger	Magaria thermoelec. power stn.	Constr.	360	-	360	360
	Sub-total		700	-	700	700
	Yaoundé I					
	2nd EDF					
Burundi	- Bugarama hydroelec. power stn.	Constr.	257	-	257	257
	- Rwegura hydroelec. power stn.	Study	34	-	34	34
	- EGL Study Corp.	Study	-	50	50	50
Cameroon	Garoua elec. power stn.	Constr.	724	-	724	724
Comores	Moroni & Mutsamudu network	Study	4	-	4	4
Mali	- Selingué dam	Study	70	-	70	70
	- Sansanding dam	Study	5	-	5	5
Madagascar	Andapa hydroelec. power stn.	Study	90	-	90	90
Niger	Maradi elec. power stn.	Study	38	-	38	38
Rwanda	- Mururu Shagasha power line	Study	62	-	62	62
	- Elec. infr.	Study	719	-	719	719
	- Ntaruka Ruhengeri power line	Constr. Constr	596	-	596	596
	- Building of HT and MT lines	Constr.	1,600	-	1,600	1,600
	- Cyangugu power lines	Study	8	-	8	8
	- Energy progr.	Study	30	-	30	30
	- Mururu power line	Study	16	-	16	16
	- Ntaruka hydroelec. works	Constr.	224	-	224	224
	- EGL Study Corp.	Study	-	50	50	50
	- Mukungwa hydroelec. power stn.	Study	30	-	30	30
	- T.A. for elec. infr.	Study	77	-	77	77
Zaire	- INGA grid	Constr.	19,350	-	19,350	19,350
	- EGL Study Corp.	Study	-	50	50	50
	Sub-total		23,934	150	24,084	24,084

	Yaoundé II 3rd EDF					
Burundi	Ruzzi II power stn.	Study	-	72	72	72
Mali	- Selingé dam	Study	216	-	216	216
Rwanda	- Kigali-Kigorra HT line and southern MT grid	Constr.	6,722	-	6,722	6,722
	- Shagasha-Gisakura power line	Study	16	-	16	16
	- Shagasha Cia. power line	Constr.	557	-	557	557
	- Kigoma-Mururu HT line	Study	94	-	94	94
	- Kogorra-Moroni HT line	Constr.	6,878	-	6,878	6,878
	- T.A. for elec.infr.	T.A.	213	-	213	213
	- Ruzzi II power stn.	Study	-	72	72	72
	- Mukungwa Nta. MT line	Constr.	69	-	69	69
Zaire	- Ruzzi II hydroelec. power stn.	Study	-	72	72	72
	Sub-total		14,765	216	14,981	14,981
	LOMÉ I 4th EDF					
Burundi	Tora power stn.	Study	400	-	400	400
Ghana	Krong dam	Constr.	8,980	-	8,980	213,090
U.Volta	Kompienga dam	Study	250	-	250	250
Kenya	Dam on UPPER Tana Energy plan	Constr. Study	26,340 140	- -	26,340 140	110,660 140
Malawi	Nkula FALLS II dam	Constr.	8,500	-	8,500	65,170
Madagascar	Andapa power stn.	Study	198	-	198	198
Mali	Selingé dam	Constr.	23,312	-	23,312	125,200
Rwanda	Mukungwa dam	Constr.	20,000	-	20,000	30,640
Samoa	Magiagi dam	Constr.	2,677	-	2,677	3,242
Somalia	Baardheera dam	Study	4,000	-	4,000	4,000
Niger	Kandadji dam	Study	1,923	-	1,923	1,923
Burundi) Rwanda) Zaire)	Ruzzi dam	Study	-	1,200	1,200	1,200
S.Leone) Liberia)	Maro River dam	Study	-	2,370	2,370	2,370
W. Africa	Surveys of dams in W.Afr.	Study	-	18	18	18
Burundi	Ngozi Kayamza electrif.	Constr.	1,100	-	1,100	1,100
U. Volta	Electr. power stns.	Constr.	1,154	-	1,154	2,100
Tuvalu	Thermoelectr. power stn.	Constr.	315	-	315	400
Rwanda Burundi Zaire	Kivu methane gas	Study	-	300	300	300
Ethiopia	Cotobie:Combolcha power line	Constr.	16,000	-	16,000	16,000
Cape Verde	Praia elec. power stn.	Constr.	350	-	350	350
Uganda	Electricity	Constr.	2,000	-	2,000	2,000
Rwanda	Kigoma-Mururu HT line	Constr.	3,900	-	3,900	6,600
N.Antilles	Thermal energy from ocean	Study	160	-	160	160

Barbados	Agric. dev.	Constr.	25	-	25	25
Comores	Elec. supply for Hertzian relay stn.	Constr.	200	-	200	200
Cameroon	Irrig. in Logone and Chari	Constr.	350	-	350	350
Ivory Coast	Thermal energy from ocean	Study	200	-	200	200
	Energy from sugar cane	Study	100	-	100	100
Ethiopia	Geothermal energy	Constr.	8,800	-	8,800	13,830
Guyana	Upper Deme forestry proj.		5,450	-	5,450	5,450
Guinea	MicroHEP stn.	Study	20	-	20	20
U. Volta	Expl. of molasses	Study	80	-	80	80
Marquesas Isl.	Pilot proj. for an elec. prod. from gas in Polynesia	Demonstr. proj.	270	-	270	270
Mauritania	Intensif. of agr. prod. in Senegal valley	Integr. proj.	475	-	475	475
Malawi	Heating of hospital	Constr.	100	-	100	100
Niger	Constr. of solar pumps and motors	Research				
	- Part I		550	-	550	550
	- Part II (still to be financed)		550	-	550	550
Sudan	Expl. of molasses	Study	115	-	115	115
Togo	Village hydroelec. progr.	Integr.	80	-	80	80
Tuamotu	Constr. of 5 plants for elec. prod. from gas in Polynesia	Constr.	382	-	382	460
Benin	E. A. survey	Study	3	-	3	3
Zaire	E. A. survey	Study	6	-	6	6
Zaire	Restoration of telecomm.	Study	150	-	150	150
Rwanda) Burundi) U. Volta)	Study of anaerobic digestors in trop. Afr.	Demonstr. proj.	-	300	300	1,100
CEAO & CILSS member countries	Study of regional solar energy for W. Afr.	Study	-	100	100	1,000
Cameroon) Congo) CAR) Senegal) Zaire)	Integr. of microHEP in equat.Afr.	Study	-	100	100	100
Rwanda) Burundi) Zaire)	Integr. of gas producers in equat. Afr.	Demonstr. proj.	-	300	300	300
Mali Niger Cameroon Senegal	Assessment of solar energy equip.	Study	-	100	100	100
ACP	Varese conf. on solar energy	Study	-	200	200	400
CDB	Study of expl. of biomass in Carib.	Study	-	30	30	30
	Sub-total		139,605	5,018	144,623	612,455
	GRAND TOTAL		179,004	5,384	184,388	652,220

Distribution of energy projects by sector - 1958-1980

ANNEX IV

Period	Financ. instr.	Sector	Nat.prog. 000 ECU	Reg.prog. 000 ECU	Commission total 000 ECU	Est.cost 000 ECU	Number	%
1958 to 1962	Treaty of Rome 1st EDF	HEP Thermal power Transport networks Alternative energy sources Others	340 360	-	340 360	340 360	1 1	48,5 51,5
		Sub-total	700	-	700	700	2	100,0
1963 to 1968	Yaoundé I 2nd EDF	HEP Thermal power Transport networks Alternative energy sources Others	710 724 22,355 38 107	- - - - 150	710 724 22,355 38 257	710 724 22,355 38 257	7 1 8 1 3	2,9 3,0 92,9 0,15 1,05
		Sub-total	23,934	150	24,084	24,084	20	100,0
1969 to 1974	Yaoundé II 3rd EDF	HEP Thermal Transport networks Alternative energy sources Others	216 - 14,336 - 213	216 - - - -	432 - 14,336 - 213	432 - 14,336 - 213	2 - 6 - 1	2,8 - 95,7 - 1,5
		Sub-total	14,765	216	14,981	14,981	9	100,0
1975 to 1980	Lomé I 4th EDF	HEP Thermal power Transport networks Alternative energy sources Others	96,580 4,919 19,900 18,066 140	3,588 - - 1,430 -	100,168 4,919 19,900 19,496 140	558,361 5,950 22,600 25,404 140	14 5 2 29 1	69,3 3,4 13,8 13,5 -
		Sub-total	139,605	5,018	144,623	612,455	51	100,0
1958 to 1980		GRAND TOTAL	179,004	5,384	184,388	652,220	82	

NATIONAL ENERGY PROJECTS
5th EDF

VIII-C-4
September 1981

COUNTRY	Amount I.P.		Energy and Mining		Alternative energy sources		Projects clearly identified or mentioned
	Bracket 5th EDF	Amount S.L.	%	m ECU	%	m ECU	
1. BAHAMAS	2.0 2.3	-	-	-	-	p.m.	
2. BARBADOS	3.5 4.0	-	-	-	-	-	
3. BENIN	52.0 59.0	8.4	7	3.6 4.1	-	p.m.	Programme on use of renewable energy sources (0.6 m ECU)
4. BOTSWANA	22.0 25.0	4.8	10	2.2 2.5	-	-	. 7 surveys in mining and energy fields
5. BURUNDI	70.0 78.0	11.3	14	9.8 10.9	-	-	. Tora power station (5 m ECU) . Gitenge power station (8.2 m ECU) . ST Ministry of Energy and Mining
6. CAMEROON	65.0 77.0	19.8	-	-	-	-	
7. CAPE VERDE	15.0 17.0	1.6	6	0.9 1.0	-	-	. Generation and distribution of electricity in Praia
8. COMORES	13.0 16.0	1.6	(60)	Ports (7.8 9.6)	-	-	. Reduction of energy dependence (hydroelectricity on Anjouan and Moheli and geothermal energy on Grande Comore)
9. CONGO	28.0 32.0	9.3	-	-	-	-	
10. IVORY COAST	46.0 63.0	14.4	-	-	4	1.840 2.5	. CI/511/81 - marine thermal energy . CI/512/81 - tropical technology . CI/515/81 - solar pumps
11. DJIBOUTI	4.8 5.4	-	30	1.4 1.6	-	p.m.	. Exploitation of underground resources (geothermal, brine, gypsum, etc.)

12. DOMINICA	3.2 3.7	-	-	-	-	-	
13. ETHIOPIA	125.0 144.0	21.0	6	7.5 8.6	-	p.m.	. ET/507/80 - 'Amarti-Finchaa' hydro-electricity project (estimated cost = 10 m ECU
14. FIJI	12.0 15.7	-	-	-	2	0.2 0.3	. Alternative energy development
15. GABON	14.0 17.5	5.1	28	3.9 4.9	-	p.m.	. GA/504/80 - small-scale hydro-electric power stations
16. GAMBIA	13.0 16.0	3	-	p.m.	-	-	
17. GHANA	55.0 63.0	15.5	8	4.4 5.0	-	p.m.	. Small-scale hydro-electric power stations
18. GRENADA	3.2 3.7	-	-	-	-	-	
19. GUINEA	74.0 84.0	12	(10 Energy) (3 Mining) 13	9.6	-	(1.5)	. GUI/506/81 - Installation study centre on new sources of energy . GUI/507/81 - Small-scale hydro-electric power stations . GUI/508/81 - Water and electricity supplies for smaller towns . N'Andan dam
20. GUINEA BISSAU	23.0 27.0	2.6	6	1.4 1.6	-	-	
21. EQUAT. GUINEA	8.5 10.0	-	10	0.8 1.0	-	-	. Plan for rationization of use of energy resources (esp. distribution)
22. GUYANA	13.0 16.0	-	-	-	15	2.0 2.4	. GUY/511/80 - Alternative source of energy species trial programme . GUY/512/80 - Steam turbine generating plant . GUY/521/81 - Upper Demerara forestry project (supplement)
23. UPPER VOLTA	78.0 89.0	12.7	19	14.8 16.9	-	p.m.	. HV/507/80 - Kompienga hydro-electric dam
24. JAMAICA	24.0 27.5	6.7	-	-	-	p.m.	

25. KEYNA	74.0 90.0	24.9	27	20.0 24.3	-	p.m.	. KE/514/80 - Energy study . Turkwel scheme . (Kiambere scheme - EIB-IBRD . (Rural small-scale industries)
26. KIRIBAT	3.6 4.2	-	-	-	-	p.m.	. Alternative sources of energy p.m.
27. LESOTHO	26.0 30.0	5.8	19	4.9 5.7	-	-	
28. ST. LUCIA	3.5 4.0	-	-	-	-	-	
29. LIBERIA	29.0 34.0	7.7	7	2.0	-	-	. LI/502/81 - Development of domestic energy resources (2 m ECU)
30. MADAGASCAR	73.0 81.0	19.8	3	2.2 2.4	-	p.m.	. Electricity supplies for Mahabo (small-scale hydro-electric power station) . Mining, energy and scientific research
31. MALAWI	76.0 84.0	16	8	6.0 6.7	-	p.m.	. MAL/514/81 - Nkula Falls power (or alternative) expansion . MAL/515/81 - Kamuzu dam . Strategic fuel reserve . ST energy . Development of alternative energy resources
32. MALI	85.0 97.0	13.8	8	6.8 7.8	-	-	
33. MAURITIUS	18.5 21.5	5.7	-	-	-	-	
34. MAURITANIA	40.0 46.0	8.4	5	2.0 2.3	-	-	. MO/502/80 - Nouakchott wharf (2.4 m ECU)
35. NIGER	73.0 84.0	8.0	-	-	8	5.8 6.7	. Kandadji dam . Renewable energy sources
36. NIGERIA	50.0	-	20	10.0	-	-	. Science and Technology (TA)
37. UGANDA	85.0 87.0	9.2	Energy 6 Mining 1	5.1 5.2 0.8 0.9	-	-	. Rural electrification scheme
38. PAPUA N.G.	22.0 27.0	7.2	-	-	-	-	

39. CENT. AFR. REP.	49.0	4.3	4	2	-	-	. Development hydro-electric potential . Renewable energy sources
40. RWANDA	72.0 80.0	11.3	10	7.2 8.0	-	-	. RW/510/80/ST and installation power lines . ST overall rural electrification + small-scale hydro-electric power stations . Provision of solar generators for 4 clinics (not in I.P)
41. SOLOMON ISLANDS	11.0 12.4	-	-	-	-	-	. Mukungwa power station (Excess)
42. S. TOME	3.6 4.2	-	-	-	-	-	. ST alternative energy sources
43. SAMOA	5.5 6.4	-	70	3.8 4.5	-	-	. SAO/501/80 - Sauniatu hydro-electricity scheme . SAO/502/81 - Copra storage and handling facilities
44. SENEGAL	65.0 75.0	21	-	-	2.5	1.6 1.9	. SE/508/80 - New energy sources
45. SEYCHELLES	3.2 3.7	-	-	-	-	-	
46. SIERRA LEONE	45.0 52.0	4.9	-	-	-	p.m.	. Development of hydro-electric and alternative energy sources
47. SOMALIA	73.0 83.0	7.7	-	-	-	p.m.	. Baardheere dam . ST planning of energy resources (not in I.P.)
48. SUDAN	100.0 114.0	21.4	-	-	-	-	. Feasibility study new hydro-electricity scheme on the White Nile
49. SURINAM[1]	(18-19) 37-38	4.5	69	25.5 26.2	-	-	. SU/501/80 - Kabebo hydro-electricity project
50. SWAZILAND	17.0 19.0	3.2	-	-	-	-	
51. TANZANIA	115.0 132.0	18.3	-	-	-	p.m.	
52. CHAD							
53. TOGO	40.0 46.0	6.6	-	-	-	0.6	. Biogas survey and pilot project
54. TONGA	3.6 4.2	-	-	-	-	-	

[1] Programming includes residues from 3rd and 4th EDF (+19 m ECU)
The amount involved is therefore between 37 and 38 m ECU

55. TRINIDAD & TOBAGO	10.5 11.5	-	-	-	-	-	
56. TUVALU	0.8 1.0	-	20	0.16 0.2	-	-	. TUV/501/81 - Funafuti power station (Continuation Lomé) . Improvement of electricity distribution
57. ST VINCENT	3.5 4.0	-	-	-	-	-	
58. ZAIRE	100.0 112.0	27.5	5	5.0 5.6	-	-	. ZA/506/80 - power stations . ZA/507/80 - Kinshasa industrial grid . ZA/508/80 - electricity Tahala . Alternative sources of energy
59. ZAMBIA	53.0 60.0	14.8	9	4.7 5.4	-	p.m.	. ZAM/506/81 - Mpongwe electrification (5.5 m ECU) . ZAM/507/81 - Mkuski electrification study . ZAM/513/81 - Zambia energy study (TA) . ZAM/514/81 - Zambezi Basin H.E. study
60. ZIMBABWE	40.0	10.0	20	8.0	-	p.m.	
GRAND TOTAL	2,273.5 2,583.0	431.8					

ANNEX VI

REGIONAL ENERGY PROJECTS

5th EDF

COUNTRY	TITLE	COUNTRIES SUPPORTING APPLICATIONS
1. BAHAMAS	-	
2. BARBADOS	-	Dominica, Grenada, St Lucia - St Vincent
3. BENIN	Mono project (Preparation of Nangbeto site for development of hydro-electricity)	Togo
4. BOTSWANA	. Energy . Alternative sources of energy (rural field) . Telecommunications (training)	
5. BURUNDI	. Development of peat resources of Burundi and Rwanda	Rwanda
6 . CAMEROON	-	Guinea Bissau
7. CAPE VERDE	. Regional development of renewable sources of energy (regional wind power centre, etc.)	
8. COMORES	-	
9. CONGO	-	
10. IVORY COAST	. Basic ST on production of energy from vegetable waste (Conseil de l'Entente)	Upper Volta Niger
11. DJIBOUTI	. Geothermal energy	
12. DOMINICA	-	
13. ETHIOPIA	-	
14. FIJI	. Energy Regional energy centre and pilot projects and feasibility studies	
15. GABON		
16. GAMBIA	-	
17. GHANA	. Bui hydro-electric dam	
18. GRENADA	-	
19. GUINEA	-	
20. GUINEA B.	-	

21. EQUAT. GUINEA	-	
22. GUYANA	-	
23. UPPER VOLTA	.ST. on production of energy from vegetable waste (Conseil de l'Entente)	Ivory Coast Niger
24. JAMAICA	.Development of alternative energy resources by means of studies and pilot projects .Scientific and Technological Research and Development (energy)	
25. KENYA	-	
26. KIRIBATI	.Regional Energy Programme	Solomon Isl.
27. LESOTHO	-	
28. ST LUCIA	.Alternative sources of energy (biomass)	St Vincent
29. LIBERIA	.Mano River Union (Hydro-electricity project)	
30. MADAGASCAR	-	
31. MALAWI	-	
32. MALI	-	
33. MAURITIUS	.Sea wave pilot scheme	
34. MAURITANIA	-	
35. NIGER	.ST. on production of energy from vegetable waste (Conseil de l'Entente)	Ivory Coast Upper Volta
36. NIGERIA	-	
37. UGANDA	-	
38. PAPUA N.G.	.Regional Energy Programme	
39. CENT. AFR. REP.	-	
40. RWANDA	.Lake Kivu methane gas deposits .Ruzizi II hydro-electricity project .Exploitation of peat resources of Rwanda and Burundi .Electricity supply line Ruhengeri, Cyanika, Ciscre (Rwanda-Uganda) .Support for activity of CEPGL and OPK	Zaire Zaire Zaire
41. SOLOMON ISL.	.Regional Energy Programme	Kiribati
42. S. TOME	-	
43. SAMOA	.Energy: Alternative sources of energy	

44. SENEGAL	-	
45. SEYCHELLES	-	
46. SIERRA LEONE	.Energy	
47. SOMALIA	-	
48. SUDAN	-	
49. SURINAM	-	
50. SWAZILAND	-	
51. TANZANIA	.Kagera Basin Development Authority	
52. CHAD	-	
53. TOGO	.Mono project (Preparation of Nangbeto site for hydro-electricity project)	Benin
54. TONGA	.Energy	
55. TRINIDAD AND TOBAGO	-	
56. TUVALU	-	
57. ST VINCENT	- .Alternative sources of energy (biomass)	St Lucia
58. ZAIRE	.Exploitation of Lake Kivu methane gas deposits (CEPGL) .Completion of Ruzizi II hydro-electric power station .Completion of MOBAYE hydro-electric power station (with RCA)	Rwanda
59. ZAMBIA	.Improvement of cooperation in the energy sector	

Member countries of CEAO and ICDCS — .Regional energy centre in West Africa CCRES

ANNEX VII

Energy production and consumption figures for selected ACP and EEC countries

	Energy production		Energy consumption		Energy consumption per capita (kilograms of coal equivalent)		Energy consumption per dollar of GDP (kilograms of coal equivalent)		Energy imports as percentage of merchandise exports	
ACP	1960-74	1974-78	1960-74	1974-78	1960	1978	1960	1978	1960	1977
Ethiopia	14.1	1.8	14.7	-7.8	8	20	0.1	0.2	11	27
Mali	..	10.8	5.5	5.9	15	30	0.2	0.3	13	25
Somalia	..	..	7.4	27.4	19	55	0.2	0.6	4	13
Burundi	..	23.4	..	3.1	..	12	..	0.1	..	7
Chad	..	..	7.2	5.0	10	22	0.1	0.2	23	27
Upper Volta	..	..	6.5	10.9	5	25	0.1	0.3	38	19
Malawi	..	9.4	..	2.8	..	52	..	0.3	..	15
Rwanda	..	2.8	..	11.2	..	17	..	0.1	..	11
Guinea	16.1	(.)	3.2	1.8	65	91	0.3	0.4	7	..
Sierra Leone	..	..	10.3	-0.6	31	100	0.3	0.5	11	10
Zaire	3.0	53.5	4.3	2.0	87	69	0.9	1.0	3	16
Niger	..	..	14.3	7.5	5	38	(.)	0.2	6	..
Benin	..	..	8.8	-4.5	39	56	0.2	0.3	16	43
Tanzania	10.6	13.4	10.4	0.5	41	65	0.3	0.4	..	22
Central African Rep.	14.2	4.7	7.4	8.7	37	44	0.1	0.2	12	1
Madagascar	6.8	3.5	8.9	2.3	38	78	0.2	0.4	9	22
Mauritania	..	..	16.8	4.3	18	203	0.1	0.7	39	6
Lesotho	..	..	..	..	..	..	..	..	..	..
Uganda	5.2	-4.1	9.5	-0.3	30	48	0.1	0.2	5	4
Sudan	..	16.8	13.2	1.4	52	172	0.2	0.7	8	26
Togo	..	..	12.5	12.3	23	96	0.1	0.3	10	1

	Energy production		Energy consumption		Energy consumption per capita (kilograms of coal equivalent)		Energy consumption per dollar of GDP (kilograms of coal equivalent)		Energy imports as percentage of merchandise exports	
	1960-74	1974-78	1960-74	1974-78	1960	1978	1960	1978	1960	1977
Kenya	9.3	10.5	4.2	-0.6	143	139	0.8	0.5	18	24
Senegal	..	..	4.6	4.7	121	181	0.3	0.5	8	15
Ghana	..	2.7	6.6	0.6	106	165	0.2	0.4	7	18
Cameroon	1.1	3.1	4.0	10.2	55	119	0.2	0.3	7	10
Liberia	31.8	-1.3	19.3	-0.6	86	395	0.2	0.9	3	12
Zambia	..	4.4	..	1.8	..	474	..	1.2	..	5
Zimbabwe	1.9	-3.9	..	(.)	..	579	..	1.2	..	..
Congo People's Rep.	15.7	-9.3	5.2	-0.7	119	175	0.3	0.3	25	2
Nigeria	37.4	-2.9	10.2	8.1	34	106	0.1	0.2	7	2
Papua New Guinea	...	16.2	..	3.9	51	292	0.2	0.6	7	13
Ivory Coast	9.7	-3.8	15.5	7.3	76	357	0.2	0.4	5	9
Jamaica	-0.7	-2.8	11.2	0.3	426	1,823	0.2	1.5	11	32
Trinadad & Tobago	2.8	5.9	4.8	5.5	1,775	4,965	1.0	1.9	35	39
EEC										
Greece	14.3	10.8	13.2	4.1	460	1,925	0.5	0.7	26	38
Ireland	0.1	3.8	4.7	2.6	1,838	3,292	1.2	1.1	17	15
Italy	2.2	-1.6	8.3	1.8	1,086	3,230	0.6	0.9	18	27
United Kingdom	-1.2	13.5	1.7	0.3	4,861	5.212	1.6	1.2	14	16
France	-1.3	0.6	5.8	1.6	2,474	4,368	0.7	0.6	16	24
Netherlands	16.2	-1.6	8.7	-1.5	2,504	5,327	0.7	0.8	15	19

	Energy consumption		Energy consumption		Energy consumption per capita (kilograms of coal equivalent)		Energy consumption per dollar of GDP (kilograms of coal equivalent)		Energy imports as percentage of merchandise exports	
	1960-74	1974-78	1960-74	1974-78	1960	1978	1960	1978	1960	197[illegible]
EEC										
Belgium	-7.2	(.)	4.9	0.2	3,85[illegible]	6,078	1.1	0.9	11	15
Germany, Fed.Rep.	-0.7	-0.7	4.5	1.5	3,69[illegible]	6,015	0.9	0.8	7	15
Denmark	-20.1	49.9	5.5	3.7	2,83[illegible]	5,423	0.6	0.7	15	22

Source : "The Energy Daily" (Washington, D.C.) of 25.8.1980