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SUMMARY OF NATIONAL REPORT
SUBMITTED BY FRANCE*

* The designations employed, the presentation of material and the views expressed in this paper are those of the submitting Government and do not necessarily reflect the practices and views of the Secretariat of the United Nations in any of these respects.

1. Following a review of the energy situation in France, the report describes national prospects for the use of new and renewable sources of energy by the years 1990 and 2000. For the new and renewable sources of energy listed by the United Nations Conference on New and Renewable Sources of Energy, a utilization factor of 10 per cent is anticipated for 1990, which may rise to nearly 15 per cent in the year 2000; in addition to hydroelectric power, which is approaching saturation point with respect to sites; biomass energy and the application of solar and geothermal energy to housing constitute the most promising national new and renewable sources of energy.
2. An analysis of the budgets of the main French public agencies dealing with new and renewable sources of energy reveals budget expenditures by the State of some 2.8 billion francs, with three quarters of this sum being spent on the hydroelectric programme. If expenditures by the semi-public and private sector are taken into account, the total is close to 4 billion francs.
3. Individual sources of energy are then reviewed:
 - (a) Hydroelectric power, with an equipped potential of 62.5 TWh/year and a total equipable potential of approximately 72 TWh/year;
 - (b) Biomass and firewood, which at present contribute chiefly to heating (1 per cent of the total energy consumption of France): this contribution could quadruple in the next 10 years in such forms as liquid fuels, gas generators and methanization units;
 - (c) Solar energy, which is used mainly for domestic hot water (3 million housing units equipped in 1990), swimming pools and domestic heating (at least 10 per cent of new construction). Photovoltaic applications are the subject of large-scale research, and an industry, oriented primarily towards applications in developing countries, is growing rapidly. Finally, in the field of high-temperature solar applications there are a number of large-scale experiments, including the Themis solar power plant with a rated capacity of 2 MWe;
 - (d) Wind energy, in which the main emphasis is on the development and manufacture of small and medium-sized machines (up to 200 or 300 kW);
 - (e) Sea energy, in which France has built the largest tidal power station (240 MW) and is studying the feasibility of ocean thermal energy conversion;
 - (f) Geothermal energy, primarily for use in low-temperature heating of buildings with more than 40,000 housing units equipped in 1980 and the figure expected to be 1 million by 1990;
 - (g) Oil shales and tar sands, France's resources of which are relatively modest but in which research activity is very intense.
4. Some of these new and renewable sources of energy are of particular interest in French Overseas Territories, where fossil fuels are non-existent and costly. Two

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examples are an important experimentation programme in French Polynesia and an interesting method of using bagasse for electricity on the island of Réunion.

5. The most important sphere of France's international co-operation is its relations with the Commission of the European Communities. France participates actively in designing and carrying out programmes in both the solar and the geothermal fields. For example, France, together with the European Communities, Italy and the Federal Republic of Germany, is financing the construction of the 1-MW solar electric power station in Sicily.

6. This co-operation is also reflected in close contacts with the specialized agencies of the United Nations (the Food and Agriculture Organization of the United Nations, the United Nations Educational, Scientific and Cultural Organization, the World Bank, etc.), and with the United Nations Development Programme, the United Nations Environment Programme, the United Nations Industrial Development Organization and various regional organizations (the Latin American Organization for the Development of Energy (Quito), the West African Economic Community (Ouagadougou), the Asian Institute of Technology (Bangkok), etc.).

7. It is in the field of bilateral relations, however, that co-operation agreements are most numerous, both with industrialized countries and, above all, with developing countries. In 1976 a major demonstration programme was set up by France in the countries of the Sahel and has since been extended to all French-speaking African countries. It is being carried out with the help of some 30 French technical co-operation staff and covers several hundred installations concerned with rural development (water pumping, dispensaries, telecommunications, small gas generators, carbonization of agricultural wastes, etc.), using both photovoltaic and solar heat conversion and wind and biomass energy. This programme now provides a pattern for the bilateral co-operation which is developing very rapidly with other countries, particularly in Latin America and South-East Asia.

8. This effort is accompanied by many scientific exchanges and by education and training activities. Many French agencies are contributing their experience in, for example, the fields of electricity and petroleum to technical assistance programmes. A specialized centre for energy planning has been established to deal with the economic aspects of inventorying requirements. Finally, in addition to the financial contributions made through the Ministry of Foreign Affairs, a number of French government agencies have a policy of grants to developing countries, while low-interest loans are granted either by the Treasury or by specialized financial institutions.

9. The report submitted by the French Government analyses the contribution of new and renewable sources of energy to economic development. An important distinction is to be made between the role of certain new and renewable sources of energy (large dams, biomass energy) which make a significant contribution to the energy balance of industrialized or developing countries, and that which the more decentralized new and renewable sources of energy can play, with modest unit capacities, in rural development in isolated and barren regions.

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10. The general conclusion is that the contribution of new and renewable sources of energy must be analysed in terms of needs to be met, local or regional potential, the pre-existing situation - particularly as regards institutions - in the area under consideration and finally, recognition of natural and socio-cultural constraints. All these criteria and constraints must be taken into account in devising international co-operation programmes for new and renewable sources of energy. France is prepared to contribute its extensive experience to the work of the United Nations Conference on New and Renewable Sources of Energy.
