RENEWABLE ENERGY SOURCES IN LATIN AMERICA AND THE CARIBBEAN

SITUATION AND POLICY PROPOSALS

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RENEWABLE ENERGY SOURCES IN LATIN AMERICA AND THE CARIBBEAN: SITUATION AND POLICY PROPOSALS

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This document has been prepared as part of a joint project with the German Agency for Technical Cooperation (GTZ) entitled “Promotion of economic development through the integration of environmental and social policy approaches in Latin America and the Caribbean”. It will be submitted to the delegations attending the World Conference on Renewable Energies to be held in Bonn, Germany, in June 2004 for their consideration. The preparation of the document was directed and coordinated by Hugo Altomonte, Chief of the Natural Resources and Energy Unit of ECLAC, Manlio Coviello, Energy Expert, and Fernando Cuevas, Chief of the Energy Unit of the ECLAC subregional headquarters in Mexico. The text was reviewed by Fernando Sánchez-Albavera, Director of the Natural Resources and Infrastructure Division of ECLAC, in collaboration with José Javier Gómez, Economic Affairs Officer with the Sustainable Development and Human Settlements Division of ECLAC. Technical support for the study was furnished by Hugo Ventura, Economic Affairs Officer with the ECLAC subregional headquarters in Mexico, and substantive inputs were provided by the following international experts: Luiz Augusto Horta Nogueira, Odón de Buen, Thomas Scheutzlich, Ricardo Esparta, Oswaldo Lucon and Alexandre Uhlig.

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SUMMARY

The World Summit on Sustainable Development, held in Johannesburg, August 2002, responded to a new cycle of global meetings that began with the Millennium Summit. The main characteristic of this new cycle is that the focus of the debate has moved away from declarations of principle toward identifying objectives and areas of concrete action, with quantitative commitments and deadlines for compliance.

Debates about energy held an important position in Johannesburg. The positive links between access to energy, eliminating poverty and improving people's health and quality of life were emphasized. Although there was agreement on the need to expand the use of renewable energy resources and increase the percentage of energy produced from renewable sources, unlike other areas of debate, it was not possible to establish global targets and deadlines. Nonetheless, some regions, among them Latin America and the Caribbean through the Latin American and Caribbean Initiative for Sustainable Development, did agree on concrete targets.

The Brasilia Regional Conference on Renewable Energy (Brasilia, October 2003), represented not only one of the first efforts to concretize the target agreed upon on at Johannesburg, but also the first joint meeting of authorities and representatives of Latin American and Caribbean Ministries of the Environment and Energy. This instance of convergence approved the Brasilia Platform on Renewable Energies, which establishes among its main points: "To further efforts to achieve the goal set forth in the Latin American and Caribbean Initiative for Sustainable Development of ensuring that by the year 2010 the use of renewable energy by the region, taken as a whole, amounts to at least 10% of its total energy consumption on the basis of voluntary efforts and taking into account the diversity of national situations. This percentage may be increased by those countries or subregions that voluntarily wish to do so."

As this paper reveals, in late 2002, Latin America and the Caribbean had already met the targets established in Brasilia, with renewable sources contributing more than one quarter of the Total Energy Supply[1] (25.7%), led by hydro-electric energy accounting for almost 15%, sustainable fuelwood with 5.8%, and cane products with 4.1%. The rest of renewables, such as other biomass (0.5%) and geothermal (0.7%) are marginal, while wind and solar energy, although used, are yet not counted as part of energy supply.

The region has an important store of both fossil and renewable resources. The reserve to production ratio stands at more than 35 years for oil and more than 40 years for natural gas, while hydroelectric power potential that is economically feasible stands at more than 500 GW, of which just 22% is being used. Despite the resources available, no suitable development of geothermal energy is apparent and, at the same time, it would seem that the contributions of other technologies such as solar and wind power are not duly counted, as we will see below in the subregional analysis.

In preparing this paper, ECLAC has sought to achieve the balanced integration of sustainable development's many components as its referential framework, so this study covers the economic, social, energy and environmental spheres using an integrated perspective. From this perspective, the target achieved by the region as a whole must be carefully analysed, since there are clear differences between subregions and countries within subregions:

[1] Note that while the Brasilia platform sets the target as 10% of consumption, this calculation used supply, due to the problems and methodological limits detailed in chapter 3.

- In terms of the store of natural resources and energy supply and consumption structures;
- In terms of the institutions and baseline conditions for encouraging policies to promote and ensure the use of renewable sources.

An analysis of the renewability of the total supply shows that Caribbean subregion "1" (including Barbados, Grenada, Guyana, Jamaica, Suriname and Trinidad and Tobago) is well below the 10% line, while Mexico is just slightly above it; this means these countries must make a significant effort if they want to achieve the target for renewables' share over total supply, in the case of the former, and to sustain it, in the case of the latter. Those subregions that have achieved the 20% to 30% range (the case of the Caribbean 2 subregion countries, Dominican Republic, Haiti and Cuba, and the Andean Community) should act decisively in both political terms and in promoting renewable energy. Moreover, in certain Central American countries, Guatemala, El Salvador, Honduras, Nicaragua, the role of forest energy (woodfuel) is very important and if, on one hand, in terms of sustainable development this is positive, since it points to weak use of fossil fuels, on the other it is clearly negative, due to the strong impact on national forestry resources and the quality of users' lives.

In contrast, in countries where the use of biomass for energy purposes is virtually non-existent, as in Argentina, Mexico, Venezuela and Ecuador, problems of sustainability could exist due to the heavy use of fossil fuels at the final industrial and residential level, and intermediate consumption in generating electric power. In these countries, hydrocarbons account for 80% to 90% of total energy supply.

Apart from this general positioning of the subregions and certain countries in terms of this initiative, other points of analysis arise that should be explored, due to both the medium-term implications of this positioning and the composition and structure of sustainability of the energy supply.

The Residential Sustainability Index (RSI) reveals the importance of fuelwood in supplying families' basic calorie requirements, mainly for cooking, heat, and hot water. A high RSI means that the country is heavily dependent on fuelwood to satisfy the population's needs. This study has revealed a wide range of technologies using fuelwood combustion and conditions of use throughout the region, which are relevant in terms of energy efficiency and negative health effects.

The RSI can also be read in terms of social liabilities, with reference to the general population's poverty levels and the access that people in marginal urban and rural areas have to better quality energy sources. Thus better quality sources are generally associated with a higher monetary cost, but also to greater efficiency and higher yields, to less time spent gathering fuel and to lower levels of household pollution.

The subregions most dependent on fossil fuels (Caribbean 1 and Mexico) are below the RSI line of 20%, as they are heavy users of secondary liquid hydrocarbons. In this case, they could post a consumption of useful energy and therefore a higher level of satisfaction of the basic requirements for caloric use, than the other subregions. At the opposite extreme are the Central American countries, with a ratio that is over 1.4 times, which indicates not only an excessive dependence on fuelwood in both rural and marginal urban areas, but also an insufficient supply of the necessary basic calories, in terms of both access and quality.

Another indicator that to some degree measures the sustainability of energy systems is the Polluting Electric Power Generation benchmark (*Generación Eléctrica Contaminante*), measured by the amount of CO_2 emitted as compared to total electric power production (tons CO_2/GWh). Generation in the Caribbean subregions "1" and "2", and Mexico, is particularly polluting in terms of CO_2 emissions. In

Mexico's case, this reflects the dominant role of fossil fuels in generation (almost 70% of the total is thermal). In the case of the Caribbean countries this role is clearly associated with a less efficient generation process with low yields in terms of thermal generation.

As expressed above, the specific objective of this document has been to analyse the sustainability of energy supply to 2002. That is, we have attempted to portray the situation up to the year 2002, obtaining positive conclusions in some cases and questions in others.

The application of a more dynamic, rather than static, analysis, remains pending. This would involve proposing a set of possible scenarios for the progress of Latin American and Caribbean countries and identifying the national, subregional and regional conditions that prevent those countries or subregions that do not meet the Latin American Initiative target from approaching these goals. Likewise, it could suggest ways for those that meet them, but run the risk of slipping below them, to redirect trends and policies toward the more sustainable development of their energy sector.

The detection of specific barriers along with other actions should become the basis for public policies in favour of renewable energies. The barriers to implementing energy efficiency and renewable energy measures are well documented and generally fall into five categories: technical, regulatory, economic, financial and institutional. This document includes an analysis of these barriers and adds a new type of obstacle detected, which has to do with specific social behaviour in the region.

From the diagnosis included in this study comes the need to develop and modernize institutional structures to truly integrate public policies and, moreover, encourage synergies with international financing and private investment. Thus, just as the most important task of the past decade was to build environmental institutions, the fundamental task for the coming decade must be to ensure that the environmental theme fully penetrates the economic and social agenda. An essential element in making the transition to the full incorporation of environmental sustainability into the economic agenda requires treating it as an opportunity and not merely a restriction on economic development.

Similarly, it is necessary to reduce the room for multiple governmental errors that appears during the complex process of managing, formulating, articulating and coordinating public interventions. The quality of and interactions among an important set of organizations, institutions and public policies must also be improved; these are often considered separately, as if they were bodies with a life of their own, autonomous from each other. This is common in several of the cases examined, in which programmes attempted to achieve wide penetration of renewable sources, but later proved to provide insufficient information and incentives to ensure the necessary integration, coherency and coordination of sectoral