



Energy After Rio:
Prospects and Challenges



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United Nations Development Programme

(Foreword - Abstract – Introduction)

in collaboration with

International Energy Initiative

and

Energy 21

Stockholm Environment Institute

and in consultation with

Secretariat of the United Nations Commission on Sustainable
Development

Foreword

The 1997 Review of Rio is the first opportunity within the United Nations System to examine international progress made in sustainable development as a result of the first of the global conferences in the 1990's, which was the United Nations Conference on Environment and Development (UNCED). The Rio Conference drew international attention to linkages between environment and economic development, and underscored how the sustainable use of natural resources is an essential element of any international development strategy that addresses the needs of present and future generations.

One of the main goals of the United Nations Development Programme (UNDP) is to help the entire United Nations system become a unified and powerful force for sustainable human development. For UNDP, sustainable human development means concentrating efforts in four key areas: i) eradicating poverty; ii) increasing women's role in development; iii) providing people with income earning opportunities and livelihoods; and iv) protecting and regenerating the environment. Energy production and consumption are closely linked to these issues, and to reach the objectives established by the United Nations requires major changes in the approach to energy—focusing on energy as an essential instrument to meet basic human needs.

The importance of energy in development clearly emerged at the Rio Conference. However no integrated action programme in the field of energy was agreed upon at the Rio Conference in 1992. The essential linkages between energy and socio economic development were not approached in an integrated

fashion. As a result, the recommendations concerning energy and development remain dispersed. Global consensus was reached only with regard to the important energy-related issues of climate change.

Shedding light and focusing international attention on the critical importance of energy to sustainable human development is UNDP's objective in preparing Energy After Rio: Prospects and Challenges. The current patterns of energy production and use, which shape the development process internationally, are unsustainable - and have become more so since Rio. In developing countries, energy financing as well as production and consumption patterns increasingly impede national development processes, and will continue to do so, unless new approaches are adopted.

Worldwide, an estimated 2 billion people continue to lack access to modern energy services. Though we know that energy is absolutely essential for development, little international attention has been devoted to this important relation. Agenda 21 called on nations to find more efficient systems for producing, distributing and consuming energy as well as for greater reliance on environmentally sound energy systems. Special emphasis was placed on renewable sources of energy. UNDP, through its Initiative on Sustainable Energy, is assisting programme countries to reflect these objectives—in national energy policies, investment plans, and sustainable development strategies. However, the achievement of Agenda 21 goals will require changes which go beyond aid policies and are reflected in international business, investment, trade, public and private sector policies and decisions.

What must be done? A more direct and dynamic debate on the essential linkages between energy and socio-economic development is needed, followed by translation into action in the short term, of the objectives of sustainable energy to achieve sustainable human development.

On behalf of UNDP, I hope that this report can serve to foster the international debate and consensus-building process concerning the importance of sustainable energy and refocus international commitment on this critical issue during the 1997 Review of Rio process. The authors of this volume describe the important links between energy and development, and suggest pathways that will allow energy to be deployed for the improvement of lives worldwide. This concern is at the heart of sustainable human development and, as we enter the next millennium, is one of the key global issues that will challenge all nations.

I congratulate the authors and contributors on their efforts, and am confident that *Energy After Rio: Prospects and Challenges* will be an important catalyst for decision-makers, policy-makers, academics, the international development community, non-governmental organizations and the media in highlighting the importance of energy for achieving sustainable human development.

James Gustave Speth, Administrator

New York, January 1997

A handwritten signature in black ink that reads "James Gustave Speth". The signature is written in a cursive style with some capital letters.

Abstract

In the 1990's, the UN sponsored a series of major Conferences on issues of global significance. Poverty and development, environment, population, women, and the human habitat have been discussed, and in each of these areas

agreements on objectives and agendas for action have been reached. These all contain elements linked to energy as it affects people's lives.

In this contribution to the preparatory process leading up to the June 1997 General Assembly Special Session for the review and appraisal of the implementation of Agenda 21, UNDP analyses the multi-dimensional nature of the relationship between energy and the issues addressed at the major UN Conferences.

Energy's critical linkages to poverty and development including gender disparity, population growth and food security; environment including health impacts, acidification, climate change and land degradation; the economy including investment, foreign exchange and trade impacts; and security concerns such as national access to energy supplies and nuclear proliferation, are analysed. From this it is evident that energy is not a sectoral issue but is vitally related to numerous dimensions of development.

The first finding is that current patterns of the production, distribution and use of energy are not sustainable. Based on present trends and policies related to energy, the objectives established and agreed upon at the Conferences cannot be achieved. This applies to poverty eradication as well as protection of the environment. Current unsustainable approaches to energy are a barrier to sustainable socio-economic development.

The options to reorient the development of the world energy system to help meet global objectives are analysed. Three major areas are identified: *(i)* more efficient use of energy, especially at the point of end-use, *(ii)* increased utilisation of modernised renewable sources of energy, and *(iii)* making full use of the next generation of technologies to utilise fossil fuels. It is indicated that the prospects in these areas are sufficiently promising to support a major reorientation of world energy system developments. If such a reorientation were to take place, energy can become an instrument for sustainable development. An integrated approach

focusing on the level of energy *services* provided to impact people's living conditions, economic development, environmental quality and geostrategic security is advanced.

Such a reorientation is essential, if the goals and commitments reached at the major Conferences are to be met.

The necessary reorientation will not happen by itself, under present rules, regulations and economic frameworks. Currently large subsidies are given to conventional sources of energy and environmental costs are not reflected in market prices. Crucial research and development efforts are being reduced and market introduction of new technologies faces a number of barriers. There is a vital need to focus attention on how public and private interests can be mobilised to formulate and implement the legal, institutional as well as fiscal frameworks required to promote sustainable energy. This requires a public sector-led undertaking, with important contributions from the private sector and civil society at large. It requires a renewed and action-oriented response from the international community.

1. Introduction

Energy use facilitates all human endeavor, as well as social and economic progress. Energy is used for heating and cooling, illumination, health, food, education, industrial production, and transportation. Countries have considered the production and consumption of sufficient energy to be one of their main challenges. The magnitude of energy consumed per capita has become one of the indicators of "modernisation" and progress of a country. Thus, energy issues and policies have been strongly concerned with *increasing the supply of energy*. The strategic and environmental consequences of energy consumption patterns

have been neglected for a long time. The world continues to seek energy to satisfy its needs without giving due consideration to the social, environmental, economic and security impacts of its use. It is now clear that current approaches to energy are unsustainable.

People living in poverty and destitution have benefited very little from conventional energy policies and their implementation. More than two billion people lack access to modern energy carriers and electricity. At the same time, it is widely recognised that without appropriate energy services there can be no true development.

Development strategies so far have overlooked the fundamental role of energy in poverty alleviation. The solution is not primarily one of simply providing enhanced conventional energy supplies. Experience has shown that such a strategy would be a failure both from the point of view of financial implications and environmental concerns. A fundamental reorientation is needed in the approach to energy and energy services.

Energy has been a major public policy issue for a very long time. In recent history energy gained great attention in the 1970's as a result of the 1973 and 1979 oil price shocks. The vulnerability of all economies to energy price and supply fluctuations became evident to government policy makers and consumers alike. Oil importing countries confronted serious balance of payments problems, and in some cases, debt traps. The UN Conference on the Development and Utilisation of New and Renewable Sources of Energy held in Nairobi in 1981 stressed the importance of alternative, renewable sources of energy to offset oil dependence. The hopes raised and plans formulated floundered, however, with the decline of international oil prices. In parallel, acidification and global greenhouse gas emissions were taking on new international significance as were the health concerns related to emissions. No integrated approach linking energy, environment and development emerged.

During the 1990s, the United Nations convened a series of major Conferences on global issues including the 1992 Conference on Environment and Development (UNCED) in Rio de Janeiro, the 1993 Conference on Human Rights in Vienna, the 1994 Conference on Population and Development in Cairo, the Global Conference on the Sustainable Development of Small Island Developing States, the 1995 World Summit for Social Development in Copenhagen, the 1995 Fourth World Conference on Women in Beijing, the 1996 Conference on Human Settlements (Habitat II) in Istanbul, and the World Summit on Food Security in Rome.

At each of these Conferences, Member States agreed on objectives, principles and action programmes. Energy issues have been present at all of the Conferences. In the Platforms and Programmes for Action emanating from the Conferences there are texts which clearly discuss the role of energy (see Box 1). The negative impact on human health and the environment are explicitly recognised in these documents and statements supporting the objectives of providing more energy-efficient technologies and utilizing renewable sources of energy are adopted. In addition, there are also three Conventions closely linked to energy: the Framework Convention on Climate Change (FCCC), the 1979 Convention on Long Range Transboundary Air Pollution and the Convention to Combat Desertification.

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There has not been a focused examination, however, of the role of energy for overall sustainable socio-economic development and actions called for

concerning sustainable energy have not been integrated into development strategies.

The message from the Conferences with respect to energy is that a new approach to energy is required to meet the societal objectives agreed upon by the community of nations. The impact of poverty on the natural resource base was recognised at the Earth Summit in Rio. Designing and implementing environmental protection and resource management measures to take into account the needs of people living in poverty and vulnerable groups has been repeatedly highlighted at all major United Nations Conferences since 1992. In spite of this, however, the necessary changes are not reflected in the overall trends in energy as observed in the 1990s. Present trends in energy pose serious barriers to the goals of sustainable development and poverty eradication.

In its resolution 47/190 the United Nations General Assembly "decides to convene not later than 1997 a special session for the purpose of an overall review and appraisal of Agenda 21". The same resolution "urges organisations and programmes of the United Nations to take the necessary actions to give effective follow-up to the Rio Declaration on Environment and Development and Agenda 21".

This publication was prepared in response to the 1996 General Assembly resolution 50/113 inviting relevant organisations of the UN to contribute to the special session. It builds on the work of the Conferences, drawing new insights from research and development with respect to *(i)* the role of energy in sustainable development, *(ii)* technological options to supply energy services, and *(iii)* experiences of energy policies to achieve objectives in areas linked to energy, such as those contained in negotiated Conference documents, as relevant in the world of the late 1990s.

Starting from a discussion of the social, environmental, economic and security issues of today's world, an attempt is made to describe the linkages between

these issues and energy. This publication advances an *integrated perspective* on the linkages between these vital issues and energy, and its role in achieving the objectives formulated and agreed upon at the Conferences. Not only is energy one of the determinants of these problems, but energy can contribute to their alleviation, if not to their solution. Implementing sustainable energy strategies is one the most important levers humankind has for creating a sustainable world.

In Chapter 2 linkages between energy and social, environmental, economic and security issues are reviewed and it is concluded that the present energy system and trends are not compatible with sustainable development. In Chapter 3 technology options to bring about a more sustainable energy future are reviewed and in Chapter 4, their potential impact is analysed. Finally, Chapter 5 addresses the policy issues for bringing about a sustainable energy future.

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