OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

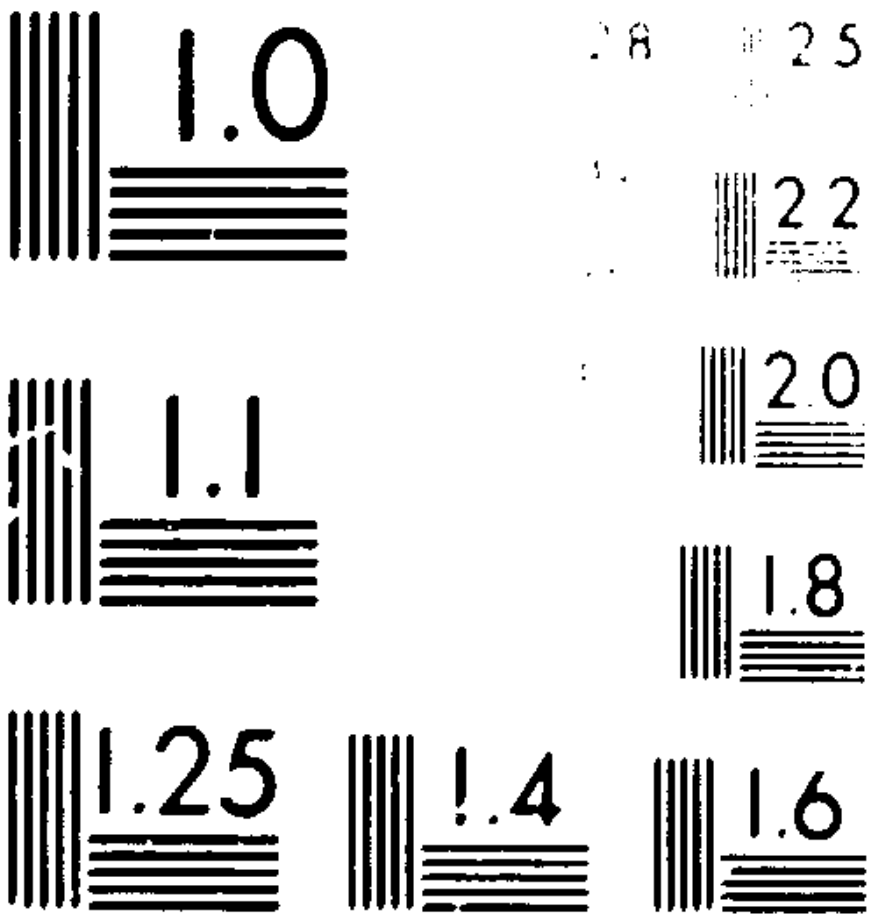
FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5

11529

OED/SAGE
9 December 1981

rev. 8 February 1982
rev. 22 February 1982

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

INFORMAL BRIEFING NOTE

BASIC OVERVIEW OF THE BROAD FEATURES OF THE ENERGY/INDUSTRY RELATIONSHIP

UNIDO/OED/SAGE

CdS/rp
25 January 1982
rev. 22 February 1982

INFORMAL BRIEFING NOTE

BASIC OVERVIEW OF THE BROAD FEATURES OF THE ENERGY/INDUSTRY RELATIONSHIP

1. Introduction

This is a concise, informal presentation of UNIDO's position in connexion with energy-related industrial development activities. It has been prepared as a background document for use in various meetings devoted to the discussion of the problems and opportunities now facing Dg.C. and Dd.C. in the energy area. 1/

This informal note should be considered and used in connexion with other extant UNIDO documents, specially UNIDO/OED.130 (A/CONF. 100/6/Add.12), UNIDO/OED.131 and the address of the Executive Director to the United Nations Conference on New and Renewable Sources of Energy (Nairobi, 10-21 August 1981).

2. UNIDO's mandate in connexion with energy

The importance of energy and energy-related technologies to the industrial development of developing countries was implicit in the "Lima Declaration and Plan of Action" resulting from the Second General Conference of UNIDO, held in Lima, Peru, 12-26 March 1975 (document PI/38). A UNIDO Energy Task Force was created by the Executive Director in 1977 and prepared a comprehensive Report (UNIDO/EX.108, 3 January 1980) which provided an overview of energy-related activities and programmes at that time. The Third General Conference of UNIDO, held in New Delhi, 21 January to 9 February 1980, in its "New Delhi Declaration and Plan of Action" (document PI/72), specifically referred to the role and responsibilities of UNIDO in energy-related industrial

---

1/ Dg.C. = developing countries
Dd.C. = developed countries

development activities. Accordingly, and as a further step towards designing and co-ordinating a UNIDO energy-related programme, the Executive Director decided to create, in April 1980, a Special Advisory Group on Energy in his Office (reference UNIDO/EX/B.165 of 23 April 1980). The decisions and recommendations relating to energy contained in the New Delhi Declaration and Plan of Action were subsequently discussed at the Industrial Development Board of UNIDO, at its 14th Session held in Vienna, 9-19 May 1980 and its Second Special Session, held 12-16 October 1980 (document ID/B/248 and GA Official Records of its 35th Session, Supplement No. 16 (A/35/16), resulting in the establishment of energy-related industrial development activities as one of UNIDO's priorities. These priorities were endorsed by the General Assembly in its Resolution 35/66.

In the Report of the United Nations Conference on New and Renewable Sources of Energy (document A/CONF.100/11), the "Nairobi Programme of Action for the Development and Utilization of New and Renewable Sources of Energy" has about one hundred direct or indirect references to industrial activities relating to energy development and utilization. The implementation of these recommendations will involve UNIDO as either a leading or a co-operating agency.

3. The broad perspective: the setting

If one considers the broad perspective of world development since 1945 it is clear that five extraordinary scientific/technological/industrial efforts took and/or are taking place:

a) The atomic/nuclear effort which led to the availability of a new kind of energy;

b) The semi-conductor research effort which led to the development of transistors and computers and to a continuing "electronic revolution";

c) The space exploration effort which led to service satellites for communications, earth resources exploration, etc.;

d) The "energy revolution": It is clear that we are now in the midst of a fourth vast international effort which will lead to a much needed

readjustment in depth in the pattern of supply, processing, management and use of energy ;

e) A fifth "revolution", whose impact will be even greater than that of the other four mentioned before, has already started. It is the "bio-technological revolution", including the new, non-Mendelian genetics ("genetic engineering"; "recombinant DNA").

While considering the broad perspective, and with no pretention to enumerate all the drastic changes that took place in the world, since 1945, it is necessary to recognize the fundamental "evolution" which took place, in the seventies, in the Dg.C.. In the 1970s developing countries as a group became essentially aware of their true problems and extraordinary opportunities. As an example, in the Lima Declaration and Plan of Action (Lima, 1975), with the support of most developed countries, they set for themselves the target of producing 25 per cent of world industrial output in the year 2000. They have since decisively expanded their efforts towards this goal and are increasingly proficient in the analysis and decisions regarding options for economic, industrial, technological and scientific development.

4. The "Lima Train of Thought and Line of Action in the Energy Area". 1/ 2/

On the basis of the broad perspective outlined above we can proceed to the presentation of more specific facts and goals which result from it.

a) The Lima Target.

Developing countries should produce 25% of world industrial output in 2000. That is, their GDP should increase from 2,2 $T.US_{80}$ in 1980, to about 9,0 $T.US_{80}$ in 2000, assuming a growth rate of 7.3 % per year (optimistic, but not unfeasible).

b) The "Lima energy implication". 2/

It follows that in terms of energy Dg.C. must increase their energy input from 1700 Mtoe/yr in 1980 to about 6500 Mtoe/yr in 2000.

1/ All figures refer to a given scenario. Even if a less optimistic scenario is used, figures will still be very large.

2/ Informal ad-hoc designation.

Or, in other words, from about 34 Mboe/d to about 130 Mboe/d.

c) The "Lima energy gap". 1/

It follows, also, that an "energy gap" of some 4800 Mtoe/yr exists and must be bridged, between today and 2000.

d) The "Lima Nairobi energy target". 1/

It follows, furthermore, that in order to reach the Lima industrial development target, Dg.C. will have to ensure and develop an additional energy input of some 4800 Mtoe/yr (or some 96 Mboe/d). Considering their resources and prospects, it is reasonable to set as a target that about one half of the additional energy required (some 2400 Mtoe/yr) should come from NRSE (mainly hydropower and biomass). The other half: petroleum, natural gas and coal.

5. Relevant consideranda.

When considering energy-related industrial development, goals and planning action to reach them, the following consideranda are relevant:

a) The relationship among development, industrialization, technology and energy.

Economic development is practically synonimous with industrial development. It is for this reason that Dd.C. are also called "industrialized countries". 2/ Industrialization depends on various factors but two of them stand out today: technology and energy. These can be considered "de facto" as the two strong currencies now determining the state and course of the world economy (international trade, finance and monetary system).

b) "Industry is central to the energy problem".

It must be recognized that well over 85% of total world energy is consumed by industry or in the operation/use of industrial products (capital and consumer goods). It is industry, through R + D, through process and product engineering and throughout effective industrial operations that will have to develop and deliver more energy-efficient and energy-appropriate capital and consumer goods, with full use of innovation, substitution, miniaturization, conservation, etc.

1/ Informal ad-hoc designation

2/ Even the smallest among them have such basic industries as: iron and steel, petrochemicals, capital goods, etc..

Industrial technology is the key to the solution of the energy problem. In fact, one can state that "there is no industry without energy and no energy without industry" in a modern economy.

c) Macrosources vs. mini-sources.

Careful examination of the problem indicates that the Lima energy gap will have to be bridged mainly by the macro-sources of energy; fossil hydrocarbons; coals (of all types); hydropower, biomass and nuclear electricity. The mini-sources (wind, geothermal, solar, etc.) are location- or purpose-specific and will, each of them, make only a minor albeit significant contribution to the overall energy balance of the Dg.C., in 2000.

d) The long term and the short term.

One must be clearly aware of the fact that the broad energy problem of Dg.C. is long term. It is necessary not to confuse it with the short term "energy emergency" or "transition", which has to do mainly with petroleum prices and balance of payments problems. It is necessary to plan imaginatively and for the long term, specially regarding biomass energy, an area which will see a drastic change from conventional to new technologies.

6. The energy/industry interaction: the goals

The three main aspects of the interaction can be concisely described as: "energy for industry"; "industry for energy"; "industrial energy management" which correspond to the three main GOALS of an integrated, comprehensive and balanced industrial energy programme.

a) "Energy for industry" has to do with the development of industrialization patterns (in terms of process, product, sector, location, size, etc.) appropriate to and consistent with the local pattern of energy availability (in terms of type, location, timing, cost, etc.); it includes development or adaptation of energy-efficient and/or energy-appropriate processes and products; it will necessarily include non-conventional processes and products, as for example: charcoal-based steel making or fuel-alcohol vehicles; on the other hand, it also comprises

full use of comparative advantages, such as the use of abundant and cheap hydropower for production of aluminium.

b) "Industry for energy" has to do with the creation of a local capability to develop, design and produce the capital goods needed for the energy sector; including equipment for petroleum, coal, nuclear, hydropower, biomass, solar energy, etc..

c) " Industrial energy management" refers to the creation of the capability to plan effectively energy production and use, from national level to plant level, in order to ensure maximum self-reliance and efficiency of the local industry in so far as the energy input is concerned. It will include energy substitution, conservation, optimization, etc.

7. The energy/industry interaction: the means.

In order to reach the above goals, it will be necessary to provide or develop the MEANS which will enable or expedite the implementation of the above goals. These include:

a) scientific and technological development through special centres and programmes;

b) education and training (including "recycling") to ensure the proper preparation of energy engineers, energy-economists, energy-technicians and skilled workers;

c) adequate legislative, fiscal and tariff regulatory measures to promote and provide incentives for improvement of patterns of energy production and consumption;

d) adequate financial machinery to promote and sustain the energy/industry development effort along the lines outlined above.

8. Conclusions

a) The Lima target carries with it specific and imperative energy implications;

b) In order to reach the Lima target an unprecedented effort will be required, on the part of developing and developed countries, in close international co-operation, to cope with the diversified and

huge energy input needed for industrialization;

c) The corresponding action required, specially from the UN system, must be the object of close and urgent scrutiny, at the highest level, in forthcoming intergovernmental meetings;

d) The factual - conceptual framework established thus far by UNIDO can provide the basis for choice of issues and goals for action in connexion with industrial development.

9. Action needed: towards a UNIDO Energy Programme.

Having established the basic factual-conceptual framework of a UNIDO Energy Programme, the next phase of the work of UNIDO in connexion with energy-related activities will be mainly concerned with the translation of the previous overview and analysis into actual programmes, sub-programmes and projects. This is already being done and should result, by mid-1982, in a set of recommendations, specially for the medium term. Actual implementation in coming years will depend on a number of variables some of which are not under UNIDO's direct control. (For example: Government requests for TA; availability of financial resources for Secretariat-programmed activities and for TA).

During 1982/83 it will also be necessary to develop and/or strengthen inter-agency co-operation. This is also being done, specially in the context of the preparations and follow-up of the Nairobi Conference.

An additional effort will also have to be made towards increasing collaboration with/from other governmental and non-governmental organizations, specially after the basic outline of the UNIDO Energy Programme is completed.