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THE NATIONAL PAPER
OF THE
REPUBLIC OF IRAQ
PRESENTED TO THE
UNITED NATIONS' CONFERENCE
ON
NEW AND RENEWABLE ENERGY
TO BE HELD
IN
NAIROBI - KENYA

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1. Introduction

Presently, energy has become the basis on which the human civilization depends; it is an aspect of man's capability to control nature and to make use thereof in his steady progress and growth through history. There is no doubt about the fact that man's ability to communicate with life depends mainly on energy. The civilization's revolution seems to have relied, in everything, upon man's capability to benefit intensively from energy as well as on his ability to transform it from one form to another according to his needs. In spite of the vital importance of energy for him, man did appreciate its importance only after he had observed new developments in the field of energy among which its increased prices and its difficult accessibility as well as the possible depletion of some of its alternatives; e.g., oil, especially when the progress of people and their developments, are measured nowadays in terms of the energy they consume. Man almost may experience, for the first time, a shock to obtain energy for his present and future needs; nevertheless, such a shock is a healthy phenomenon which had to occur so that man might, through his intelligence, draw up the appropriate procedures and solutions concerning the provision of energy for his future needs after he had realized that oil is depletable within a period not allowing a transition to the alternatives.

In such a paper which deals with the new and renewable energy, one must remember that the new and renewable energy is an important source of energy, but what is more significant is how man should learn to make efficient use of energy without any wasting thereof in addition to reducing its consumption. In such a subject, science, technology, economy, politics and sociology interfere since man is required to live on the hypothesis that energy is limited and costly; therefore what is required from the human intelligence is to treat the two questions together, the limited energy and that of increased prices: accordingly, the new and the renewable energy should assume their important role in meeting man's need for energy.

The theme of new and renewable energies requires, first of all, clear and comprehensive thoughts and they should not be excluded from other substitutes of energy since they interact. We should approach the new and renewable energy not in their absolute formula but within the context of scientific and economic concepts and our way of life as well as the environmental conditions in which they are used. Therefore, the discussion of the new and the renewable energy should be related to the environmental and the availability of technology as well as to their economic and social relevance.

The above is a necessary introduction to give the Iraqi National Paper its underlying broadlines and criteria. Furthermore, this paper is neither a discription nor an explanation of the importance of the new and the renewable energy for Iraq, but it is an expose of Iraq's experiment and Iraq's view point regarding energy in general and the new and the renewable energy in particular. As all know, Iraq is an oil producing and exporting country and has enough oil reserves to meet its needs for many decades. In addition, the new and the renewable energy mean many things, among others which are required from Iraq, in the first place is not only to utilize the new and the renewable energy but also to utilize the associated gas and to refrain from flaring the same. Before that, energy must have an economic value in spite of the availability of oil and gas, such value should not be less than its economic value in any other country in the world whether such countries are developing or developed, oil importing or exporting. The discussion of new and renewable energies should be placed within the Iraqi context; Iraq has more solar energy than it needs almost throughout the year and consumes much energy in order to get rid of this surplus energy in the course of building and house cooling and the question is: what is the new and renewable energy in Iraq ? When and how and why it should be utilized in the country ?

This National Paper is mainly designed to explain Iraq's approach to questions relating to the new and the renewable energy. However, despite the fact that it is a particular approach, it allies, nevertheless, with the approach of other countries in many respects.

2. Energy Characteristics in Iraq

We have already mentioned that Iraq is an oil producing and exporting country with adequate oil and gas reserves sufficing it for many decades. Nevertheless it is much concerned with the question of energy for many considerations such as :

- Iraq is an oil energy exporting country: the prices of such form of energy and the prospects of substituting other alternatives for oil would undoubtedly affect the internal and external energy policy of the country.

- Iraq's oil wealth is depletable, therefore, it is imperative for Iraq to shift to oil substitutes.

- The different economic sectors and the size of population grow at high rates; this leads to an increase in oil demand and consumption and this increased consumption will affect the future of Iraq's crude oil exporting capacity and would have an impact on the growth rates which depend primarily on crude oil exports.

- The prices of domestic oil products are very low. This has encouraged an overconsumption of oil products and did not allow the alternative energies to assume their role in the total energy consumption.

- In view of the fact that energy in Iraq is characterized by very low prices, therefore, it became extremely difficult to induce the Iraqi citizen to conserve energy or to use advanced technological methods to limit the utilization of oil energy by shifting towards other alternatives.

- The public sector is the biggest energy consumer in Iraq and it may become possible to deal with most of energy wasted through this channel. Moreover, due consideration should be given to the maximum efficiency and optimal utilization of the conventional and new energy sources.

Notwithstanding these characteristics which may have a negative or positive effects in handling the energy question scientifically or practically the state is able to deal with most of these questions as will be shown in this Paper.

3. The National Energy Committee

The first Arab Energy Conference held in Abu Dhabi in 1978 decided, among other things, that the Arab countries should establish National Energy Committee in each Arab country aiming at undertaking supervision, studies and consultation on

all matters relating to oil and non-oil energy on the ground that each of these countries has its specific characteristics as regards energy matters and, hence, the practical and logical solutions concerning energy differ from one country to another. As a result thereof, a national energy committee under the chairmanship of the Minister of Oil and comprising a number of high ranking state officials from different establishments was set up on 17 March, 1980 to deal intensively with the energy questions.

Although it has been recently established, the National Energy Committee has achieved a good deal of progress in the field of energy whether at national or at the international levels among which Iraq's active participation in this International Conference of the United Nations on the new and the renewable energy.

This important position has been originated from the growing conviction that Iraq, notwithstanding the low price of its domestic oil products, must concern itself with the question of new and renewable energies bearing in mind that the depletion of oil can be placed by other alternatives is unjustifiable, on the other hand, a barrel of crude oil costs the national economy as much as it costs the oil importing countries. The other reason which causes Iraq to participate in this International Conference on new and renewable energy organized by the United Nations is based

on Iraq's conviction that energy question is not a question concerning, exclusively, the energy importing countries or those which do not produce oil in sufficient quantities, but it is rather a question concerning all the nations of the world irrespective of their division in the developed and developing or crude oil exporting or importing nations.

In the final analysis, all the nations of the world will have no oil and all of them shoulder the responsibility of tackling the problems resulting from the depletion of depletable energy sources. Here appears and emerges the importance of the joint international efforts to conserve the depletable source of energy as long as possible and to shift to the alternative sources of new and renewable energies. Hence, the United Nations constitute the starting point of the international co-operation and co-ordination in this field in order to reduce the lapse of time between the depletion of the traditional sources of energy and obtaining more permanent and stable sources to meet man's growing needs in energy.

The National Energy Committee's participation in this Conference is stemmed from an objective stand towards the developing countries which are importing energy in increased quantities since it constitutes the source of its life and growth. These countries have a legitimate right to economic growth so that the world may become more stable and more just. Energy constitutes undoubtedly one of the obstacles

confronting these states in achieving the aspirations of their peoples and consequently while participating in this International Conference on new and renewable energies, Iraq is proceeding from a strong desire to participate in the efforts towards utilizing the new and the renewable energy to alleviate the economic burden on the developing countries which do not possess enough sources of traditional depletable energy.

As to the tasks of the National Energy Committee at the internal level, it covers vital matters rarely dealt with before the establishment of the Committee; among these matters, we may mention, consumption rationalization and drawing up the attention of the citizens to the necessity of reducing energy consumption to the minimum. To this end, the Committee issues directions and instructions to the energy consuming private and public sectors; it also highlights the importance of this rationalization for the national economy and calls upon the citizens to participate in a rationalization campaign through different means of information.

- The National Energy Committee underlies the necessity of the transition of the Iraqi society to a conscious one in the field of energy consumption in the future and the importance of changing the specifications of buildings and dwellings and establishing thermal insulation upon their

construction and not thereafter, as well as reducing energy consumption in the produced unit to the minimum economic limit; other economic and industrial projects should be designed on this basis.

- The scientific research, in the field of energy, has become a very important matter. Therefore, the National Energy Committee is of the opinion that the scientific research is an important source for dealing with energy related matters; for this purpose it encourages all scientific centres undertaking research in the field of energy, especially the Scientific Research Council in Iraq which carries out basic tasks in the matter of energy.

- The National Committee has endeavoured always to participate in international and national conferences and seminars held from time to time dealing with energy questions, including new and renewable energies. It feels that such conferences contribute actively to the transfer of useful ideas in addition to the training and familiarizing Iraqi specialists with the experiences of others in handling matters related to energy.

- One of the tasks, laid down by the National Energy Committee of Iraq since its inception, is the drawing up of the future energy plan and the manner of meeting the domestic energy needs as well as the proportion thereof to be met by each one of the different energy sources. Furthermore, the

drawing out of a practical energy plan for the short, medium and long run is a useful matter in adopting an efficient energy policy.

These are the most important activities carried out by the National Committee in Iraq. It is firmly hoped that this Committee will achieve progress and development in the objective approach to the questions of energy and deals with most of the economic issues resulting therefrom. Before ending with the National Energy Committee, we must refer to two important matters in the field of energy :

1. If applied exhaustively, the currently available technology for energy conservation would produce a radical transformation in the matter of consumption rationalization and efficient utilization of energy as a proof, we can mention the energy wasted as a result of producing electricity from fuel since such fuel is transformed only to the proportion of 40 per cent into electricity, which is a maximum. As to the remaining 60 per cent, it is not transformed into electricity and it is utilized only to a limited extent.

2. The process of consumption rationalization and the transition to the economic alternatives of the new and the renewable energy can be regarded only through an intellectual theory, the so-called energy management. The efficient energy consumption, its management and conservation carrying out research in its various aspects require great managerial

concern at all levels dealing with energy, the first of which being the individual, the family and the society. Without a firm and conscious managerial skill, one can not deal effectively and actively with energy questions. We mention such remarks and in this very place because the National Energy Committee considers them to be very useful in tackling the energy related issues.

4. Sources of new and renewable energy in Iraq

We have mentioned in the introduction to this National Paper that the subject of new and renewable energy should stem basically from the specific conditions of each country. In case of Iraq, for example, one should not speak of the biomass energy while the natural gas which is a secondary by-product of oil production operations, is being flared to get rid thereof. There must be priorities imposed by Iraq's circumstances and for the same reason. In the case of Iraq again, one cannot speak of geothermal utilization which is not available in appropriate quantities. The same is true with the other alternatives of the new and the renewable energy, each one should be considered in the light of its availability in appropriate quantities and forms.

It is also appropriate not to consider the subject as it stands currently, but we should consider it as it will be in the future.

We conclude therefrom that the new and the renewable energy should be regarded, as far as Iraq is concerned, in the light of its present and future objective possibilities and within an economic and practical context adopting the available technology at present or in the future. On this basis, we can review these sources of energy and the possibility of their contribution to meet Iraq's need for energy as follows :

4.1. Energy from hydraulic sources

The generation of electricity from water falls is well known since long time. The non-development of this source of energy is basically due to many factors including the low prices of the fuel used in thermal power stations and the non-availability of financial capabilities in the past for the construction of major irrigation projects in Iraq. An attentive look at the costs of producing electric power in Iraq shows that the use of local energy prices as they stand that production of electricity from thermal power stations is generally more economical than producing electricity from water falls by using hydroelectric power stations. However, if the international fuel prices are used, i.e. prices at which Iraq can export this fuel, the hydroelectric power stations projects become more economical. Therefore, this question should be borne in mind in carrying out

feasibility studies and consequently, it becomes clear that the production of electricity from hydraulic sources is of the first priority. Proceeding from this simplified idea, Iraq is presently planning to double the energy exploited thereby from hydraulic sources. This has even changed the way of utilizing the waters of the two great rivers (Tigris and Euphrates), and the other small rivers in Iraq, as well as construction of different dams for irrigation and agriculture purposes in addition to the produced from hydraulic sources is expected to account for 36 per cent of the total electric power to be generated in Iraq by 1990, whereas it accounted for 15 per cent in 1980; it also to be noted that dams and barrages are being used in Iraq for irrigation and flood control in addition to the need of agriculture in Iraq to be irrigated throughout the year, particularly in Summer when the rivers' water level declines.

4.2. The Solar Energy

We have already mentioned that the solar energy in Summer costs up a good deal of electric power to get rid of its effect in utilizing cooling means. However, this remark should not involve an under estimation of man's capacity to utilize usefully the solar energy and compensate thereby a large amount of energy. In the matter of solar energy, we should stress several important facts :

1. The technology of utilizing the solar energy is simple and complex at the same time. In addition to its variation as there is no one apparatus or invention through which this renewable energy could be utilized but there are many methods which may be totally different in their technical and scientific basis. Consequently, this complicates the utilization of solar energy, especially that the economic criteria in each method of utilizing the solar energy are adopted in a different manner. Therefore, despite its importance for man the solar energy still constitutes controversial points as regards utility.

2. The second point is that the solar energy is available in limited quantities to meet the increasing energy needs in electricity, industry and domestic consumption, notwithstanding that the solar energy is the source of life on our planet and constitutes the largest part and the first source of energy. Without solar energy, there exists no plants and no hydraulic sources of energy and life can not continue. Nevertheless, what is important is that the solar energy in question is the one which may man utilize in its radiating and thermal form so that we may determine the concept of solar energy in this paper. As regards the characteristics pertaining to Iraq, we should mention that the fields of utilization of the solar energy as a renewable energy alternative are determined by economic factors, it is

being understood that the environmental and health aspects of the citizens be within this economic concept. Furthermore, it is necessary that we consider the solar energy within the energy future economic perspective since the utilization of solar energy to meet part of the society's energy need may result in a process extending over many decades and it is a continuous one. Hence, we should adopt the future dimension of energy. On the other hand, Iraq's climate in winter is considered as moderate and requires heating for a very short period only while the temperature does not decline sharply. Therefore, the use of solar energy in heating and water heating has an important economic return as regards Iraq's circumstances even if that requires that the government should subsidize these efforts financially on the ground that the prices of oil products inside Iraq will remain lower than the costs of solar energy in these fields.

As to the desalination of sea water, the importance of the solar energy is limited as far as Iraq is concerned since Iraq does not need to desalinate sea water for the purpose of agriculture or for human needs. Nevertheless, Iraq is interested in exploiting the solar energy for desalination the underground waters in the remote and desert regions.

With regard to the high costs of electricity produced from solar energy, Iraq cannot utilize the solar energy under

the current economic standards. However, that will not discourage Iraq and it will follow up this subject through the researches undertaken inside and outside Iraq towards utilizing the various forms of solar energy in a manner corresponding to Iraq's position and needs.

Also the solar energy in the fields of heating and water heating in winter, it is certainly economical and practical for Iraq in accordance with the Iraqi perspective mentioned earlier. Iraq has started to introduce the solar energy in certain housing projects and buildings especially in the projects of the public sector and studies are underway to evaluate the utility of cooling the buildings through availability of solar energy. In case the utility thereof is proved, it will have a great impact on the total energy consumption in Iraq.

4.3. The bio-mass energy

One of the contrasts witnessed in Iraq is that until recently, Iraq was depending on this form of energy originating from animal and plant to meet the bulk of its energy needs. The transformation of the economic and social situation of the citizens and the availability of oil have undoubtedly helped to achieve this transition. One of the contrasts also is that the Iraqi society can resort easily to the use of energy originating from bio-mass sources but not in the same

manner used in the past. Despite that, it is economically useful for the national economy. In order to give a clear picture in this field, we must remember that, so far, exists neither a clear plan to utilize the bio-mass energy nor researches have been undertaken in this field. This energy should be offered in a manner different from that utilized in the past. For this purpose, the scientific research constitutes the first step in this respect, and Iraq is currently endeavouring to make bio-mass energy researches part of the tasks of facing the future energy issues in Iraq and they must be economically and practically utilized. In view of the fact that the bio-mass energy does not, in most of its uses, fall within the energy uses of the public sector, the low prices of the oil products in Iraq will remain an obstacle to the process of intensive utilization of the bio-mass energy.

4.4. Other alternative energies

Given the position of Iraq, it is useless to speak of ebbs and tides, the geothermal, the sea waves or oil shale.. etc. except within a very limited scope since they are not available in Iraq. However, the wind energy may be useful in meeting some energy needs of Iraq but, all that depends on the development achieved or to be achieved in wind power generators. Hence, we will not elaborate.

5. Iraq and the energy technology

For many reasons, some of which have been mentioned earlier in this paper, Iraq fell behind a number of countries in the fields of study and scientific research concerning energy. Nevertheless, it is giving currently an increased attention to many fields to improve its scientific status in the different fields of energy. In Iraq, there exists a specialized council for the management of scientific research to which are affiliated specialized departments. Among these establishments dealing with energy, the most important are the Centre of Solar Energy Researches and the Centre of Oil Researches. The first Centre is presently undertaking studies concerning the solar energy and the aspects of its applied and theoretical uses; it also provides advisory services at the country's level for all activities concerning the solar energy. The activities of this Centre are at present concentrated in the following fields :

- the specialized science research in the manner of utilizing the solar energy in Iraq,
- developing the equipment and apparatus used in exploiting the solar energy and manufacturing the apparatus used in the researches,
- developing the technological know-how and encouraging the commercial use of the solar energy and

propagating information in respect thereof in co-ordination with other concerned establishments.

It is hoped that the development of the scientific research in this field will lead to practical applications towards utilizing the solar energy in domestic, industrial and agricultural uses.

As for oil researches, the Oil Research Centre in Iraq is proceeding rapidly toward attaining its objectives, especially that Iraq is an oil producing and exporting country. However, this Centre is still at the stage of scientific researches concerning gas and oil industry and therefore it should be developed to deal with more comprehensive subjects concerning the conservation of oil and gas wealth, and increasing and enhancing the efficient utilization of fuels used in Iraq as well as dealing with environmental questions resulting from Iraq's oil industry and oil products utilization in Iraq.

As regards the bio-mass energy, the researches are still in their first stages and a continuous effort is required to establish a specialized centre for this purpose. The National Energy Committee together with the Research Institute in the country continue their efforts to attain a conclusive result in this respect.

On the other hand, the scientific research in the fields of new and renewable energy requires first and foremost an increased conviction and awareness of the importance of this form of energy on economic and social structures. The development and application of the simplified and known technology in this field and the transition to the advanced technology require also the training of the specialized Iraqi personnel in the different aspects of new and renewable energy and the drawing up and development of a stable and effective plan for scientific research as well as the establishment of a fundamental basis for the transfer of technology in an efficient and useful way. The research management in this field has its particular importance and clear impact on research work.

6. The international co-operation in the fields of new and renewable energy

One of the most important factors which maintains the continuity of human civilization and its growth in the co-operation between nations, whenever this co-operation is well established and profound, the growth will be clearer and more continuous. Whenever the co-operation weakens, the growth of civilization declines or loses parts of its activity; and in the fields of new and renewable energy the

importance of this co-operation is now shown clearly through fields of the present researches carried out. Such co-operation or effort will undoubtedly continue and consequently serve humanity as well as to solve part of its problems in the energy fields. The era of cheap energy has ended, the world nowadays finds itself somehow behind in the fields of utilizing new and renewable energy; for this reason, the co-operation in this field, is not only necessary but resistant. Any progress achieved in any country in this matter serves humanity. The United Nations and its competent organizations is a qualified authority for co-operating in the international efforts in order to utilize new and renewable energy, as the United Nations is able to reduce the economic pressure experienced by many nations; it can, at the same time, lessen the rapid depletion of other energies which are depletable. Such a co-operation may undoubtedly take different frames on the international, regional or bilateral basis as we mentioned, still and all are important and necessary means. Iraq certainly hopes to contribute in these efforts. However, this does not prevent us from pointing out that some industrialized countries aim at their special researches in the new and renewable energy commercial profits; moreover, they may keep the results of the researches secretly for this purpose. Such researches need great capitals; so the

contribution of many nations in their expenses especially those countries whose economy is able to exert efforts in the fields of applied, theoretical and scientific research for new and renewable energy.

7. Summary and Suggestions

As the National Paper has experienced Iraq's aspirations and goals in utilizing new and renewable energy, it proposes a group of intellectual notes which are applied in most of the countries. Although the technological and scientific research and finance are important in the fields of utilizing new and renewable energy, Iraq regards energy management and its researches significant. Without good administration, the nations cannot be able to utilize this kind of energy correctly. From this outset, consciousness is necessary and useful in this field. If some suggestions should be mentioned in this regard, we would like to present the following :

1. The international co-operation is essential in the fields of new and renewable energy and it may be achieved on world level through the frames of the United Nations and its competent organizations or through bilateral and regional frames. This co-operation includes research and economic aids for this purpose or manufacturing the equipment and installations regarding new and renewable energy.

2. Since energy questions are issues connected with civilization which concern all countries irrespectively. Every country then should take a part in developing the activities to utilize new and renewable energy, as well as to co-operate with other countries in this field. This co-operation may assume various methods which are based on the circumstances and potentialities of each country.

3. When handling the new and renewable energy cases, one should not look at it in the present status but in the future as well. From this perspective, we can understand the importance of energy and its role in respect of man.

4. Each country should lay down a future plan to utilize new and renewable energy taking into consideration the climatic and economic conditions of each country as well as the scientific research plan, and the manufacturing of necessary equipment and apparatus from these energy sources.

5. Each country should form a national committee which supervise new and renewable energy affairs aiming at co-ordinating and uniting the national efforts or else the efforts will be wasted in most countries especially the developing ones.

6. In the fields of new and renewable energy, it should be borne in mind the environmental circumstances and the abilities of utilizing them. In other words, utilization should cope with the circumstances of each country.