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17705-E

Distr.
LIMITED

ID/WG.494/12(SPEC.)
7 September 1989

ENGLISH
ORIGINAL: FRENCH

United Nations Industrial Development Organization

Regional Workshop on Energy
Conservation in Industry

Cairo, Egypt, 1-5 October 1989

REPORT OF TUNISIA*

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59/5

* The views and opinions expressed in this document are those of the authors and do not necessarily reflect the views of the UNIDO Secretariat. This document has been translated from an unedited original.

** Energy Management Agency, Ministry of the National Economy.

CONTENTS

- I. ENERGY SITUATION**
- II. ORIGIN OF ENERGY MANAGEMENT**
- III. LEGAL FRAMEWORK**
- IV. FUNCTIONS OF THE ENERGY MANAGEMENT AGENCY**
- V. PRICE POLICY**
- VI. MEASURES TO PROVIDE INFORMATION AND DEVELOP AN AWARENESS**
- VII. PRACTICAL ACTIONS**
 - **Demonstrations**
 - **Training**
 - **Energy audit management**

I. ENERGY SITUATION

The consumption of primary energy in Tunisia increased rapidly throughout the period 1970-1987 at an average annual rate of 8.6 per cent. During the same period, primary energy production (90 per cent of which is accounted for by petroleum) rose at a rate of 1.6 per cent and the gross domestic product at 2.3 per cent annually.

The slow rise in production, despite an intense prospecting effort, (4.3 million tons oil equivalent (toe) in 1970 and 5.6 million toe in 1987), coupled with the rapid increase in consumption (1 million toe in 1970 and 4 million toe in 1987), prompted the authorities to initiate, in 1981, an energy management policy designed to ensure the continuation of exports for as long as possible and in this way to defer the time at which Tunisia would become a net importer of energy.

II. ORIGIN OF ENERGY MANAGEMENT

Measures of two kinds were undertaken:

- The carrying out of sectoral surveys in order to determine the pattern of consumption in each sector of economic activity;
- The performance of energy audits at establishments with a high level of energy consumption, carefully selected in the various sectors, for the purpose of more reliably assessing the information obtained through the surveys and gauging the potential for energy savings in the main sectors.

In overall terms, these studies made it possible to ascertain more accurately the true state of affairs, to evaluate with some degree of reliability the energy savings potential, and to single out a number of measures for exploiting a part of that potential.

Nevertheless, it was not possible, in most cases, to move rapidly in a practical way towards the implementation of the measures identified.

Among the factors that contributed substantially to this inability, the following might be mentioned:

- The absence of procedures for progressing from the audit or analysis phase to the formulation of an energy savings plan and its implementation;
- The absence of a legal and regulatory framework under which the recommendations of the audits conducted would be binding on energy users and the authorities;
- The obvious lack of qualified energy audit experts capable of conducting on-site operations;
- The lack of information and the insufficient awareness on the part of energy users regarding the severity of the problem and the existence of possible ways of lessening its extent;
- The absence of fiscal and financial incentives to make investment in the rational use of energy more attractive.

Given these circumstances, it appeared necessary to establish an institutional energy management framework, based on an appropriate structure, for the purpose of alleviating the shortcomings and of formulating and promoting a carefully selected policy and moving to its implementation, recognizing that most of the thinking on this problem had already been done.

Accordingly, the Government decided to create a suitable institutional framework, and without further delay the Ministry of the National Economy set up a transitional structure, the Energy Management Company (SME), which from its inception was involved in initiating the actions envisaged, training personnel to carry out the future programmes, and preparing the way for the establishment of the Energy Management Agency (AME).

About a year after this decision was taken, in September 1985, the planned institutional framework was put into place, along with an institution, the Energy Management Agency, with responsibility for the implementation of the national energy management programme. Underlying this programme are three principal components, which may be briefly summarized as follows:

1. Regulatory measures

- The setting up of a system of periodic and mandatory audits for establishments that are major consumers of energy in the principal sectors - industry, transport and the tertiary sector;
- The introduction of the practice of prior approval by the Energy Management Agency for new projects in branches of high energy intensity;
- The formulation of energy efficiency standards for the manufacture and use of energy-consuming equipment and apparatus;
- The enactment, as part of specific sectoral regulations, of provisions governing the use of energy and of energy-efficient materials and appliances;
- The setting of conditions with respect to information and publicity regarding the use of energy.

2. Incentive measures and measures to assist in decision-making

- The conclusion of contract programmes with energy-consuming enterprises that undertake to implement the energy-saving programmes identified through the audits, involving their eligibility for substantial financial and tax benefits;
- The encouragement, through appropriate advantages, of investments designed to economize energy;
- Tax exemptions for the energy-saving equipment and products required for the implementation of the energy management measures;
- The encouragement of experimentation involving energy-efficient processes through the granting of non-repayable financial assistance that may cover as much as one-half the cost of the projects;
- The promotion of projects for the use of renewable energy sources through the granting of financial assistance covering one-half the cost of the projects.

3. Measures to generate an awareness and provide training

- The organization of periodic multi-media (press, radio and television) campaigns to arouse an awareness in the public of the need to save energy;
- The organization of seminars, information events and forums for energy users in all branches of economic activity;
- The training, through special programmes, of staff with responsibility for energy management at establishments subject to mandatory energy auditing;
- The training of candidates for positions as energy experts at design bureaux and engineering offices through the organization of basic course cycles and technical seminars;
- The preparation, publication and dissemination of brochures, manuals and other educational materials for pupils and students;
- The dissemination of technical brochures and the provision of practical advice for professionals in all sectors of economic activity.

III. LEGAL FRAMEWORK

The principal regulatory measure adopted by the authorities concerns the mandatory requirement for an energy audit every three years at all industrial-sector establishments whose annual energy consumption equals or exceeds 2,000 toe. Also subject to this requirement are establishments in the transport sector whose consumption equals or exceeds 1,000 toe and those of the tertiary sector consuming 500 toe or more.

These audits must be performed by an expert officially recognized by the Energy Management Agency, and the audit reports must be transmitted to the Agency for approval. Once they have been audited, the establishments may be eligible for assistance and benefits under a contract programme concluded with AME.

Financial assistance:

- Assistance for pre-investment studies;
- Assistance for experimentation with energy-efficient processes;
- Assistance for experimentation involving renewable energy sources;
- Assistance for the training of Tunisian technicians;
- Audit assistance.

Benefits accorded to investments designed to economize energy:

- Suspension of the customs duties and/or turnover tax payable on the acquisition of capital goods;
- Depreciation of the investments concerned at an annual rate of 25 per cent;
- Financing through credits granted on preferential terms.

IV. FUNCTIONS OF THE ENERGY MANAGEMENT AGENCY

The Agency is responsible:

(a) For implementing the Government's general policy with regard to energy conservation. In this connection, its task is to define, within the framework of the Government's directives, the specific actions to be taken in order to achieve the planned objectives. Another of its functions is to suggest to the authorities the regulatory measures it regards as useful for adding to the effectiveness of these actions;

(b) For co-ordinating the various national programmes in the area of energy conservation. In this connection, its task is to co-operate with the agencies engaged in carrying out energy-saving measures in the areas for which they are responsible, the purpose being to pool all these efforts with a view to the better use of human skills, the more rational management of the material and financial resources invested (specifically by avoiding overlapping and eliminating experiments for which there is no justification), and finally the more effective dissemination of the information among the various operators;

(c) For approving energy-saving investments and establishing contract programmes. In this connection, the Agency's function is to grant financial assistance and benefits following the completion of a technical assessment and after a decision to this effect by its Board of Directors;

(d) For monitoring and managing the mandatory periodic energy audits. As part of this task, the Agency officially recognizes the experts who are to act as the auditors following an examination of their qualifications, identifies the establishments to be audited, supervises the performance of the audits within the prescribed time-limits, reviews the reports submitted and evaluates their quality, and initiates the negotiations on contract programmes for the implementation of the recommendations;

(e) Finally, AME's role also extends to the collection and dissemination of energy-related information. To this end, it conducts surveys on consumption, maintains a current data base on energy demand, and prepares national assessments. It has its own energy documentation centre, which is destined to perform an important function at the national level.

In addition to the above, the Agency has the further task of disseminating information through various means and at various levels: campaigns to generate an awareness within the public at large, along with seminars, conferences and other demonstration forums for more limited and specialized audiences, namely, professional consumers on a branch-by-branch basis.

V. PRICE POLICY

Sound management of economic resources requires that internal energy prices should be on a par with international market prices, plus the costs of transport and distribution, so that the internal taxes added to this cost price represent net revenue for the State, undiminished by lost opportunities for export products. This has not been the case in Tunisia for a very long time.

An exhaustive study of energy prices in Tunisia since 1980 has been carried out, showing that in that year only regular and premium gasoline was being sold in the domestic market at above the international price. Consequently, the other

energy products were directly or indirectly subsidized through the leverage of the ex-refinery prices, which were always lower than the international prices.

This situation remained substantially unchanged until 1986, following the collapse of the price for crude. The authorities continued to apply a policy of gradually increasing rates, but in a manner differentiated according to products so as to take account of the country's specific socio-economic conditions, while at the same time mobilizing somewhat for the purpose of economizing energy. In this way, the Government's concern not to press too heavily on domestic prices and to avoid contributing to an acceleration of inflation was reflected in a relatively modest increase in the price of heavy fuel oil, a major industrial energy source. For its part, the unit price of gas for industrial use evolved in the same way, the costs of these two resources remaining equivalent. Moreover, in order not to penalize the more disadvantaged households, there was only a modest increase in the price of kerosene and LPG, which represent their principal source of commercial energy.

In 1986, following the fall in the price of crude, all internal prices, with the exception of that of LPG, rose above the international price level. A sizeable net element of taxation can be seen in the successive increases in fuel prices.

This action on prices, conducted prudently and with discernment, has been a major factor in contributing to the emergence of a sense of awareness in all strata of the population and in curbing the rise in consumption.

VI. MEASURES TO PROVIDE INFORMATION AND DEVELOP AN AWARENESS

Actions addressed to the community at large

Over the short term, more emphasis has been placed on actions targeted on the general community than on those intended for professional circles, since it was believed that by approaching the citizen in his daily life one could also approach him as a professional energy user and thereby create a "favourable climate" for the reception of the various conservation messages one wished to deliver.

The first actions taken consisted in organizing periodic campaigns, each dealing with a specific aspect of energy consumption.

A campaign focusing on energy use in the household has been conducted every winter since 1986.

Another campaign is aimed at motorists and is designed to encourage them to make more effective use of their vehicles so as to reduce their fuel consumption.

The various media used are television, radio, the press, billboards and the distribution of a guide containing practical tips.

Actions aimed at professionals

These involve seminars, discussions and meetings organized for the technical personnel of energy-consuming establishments, information services and specialized audiences, such as the university community and the Junior Chambers of Commerce.

Examples of action taken:

- Seminar on the rational use of energy in the industrial sector to enable researchers and industrialists, on the one hand, to share the results of their experience, and the Energy Management Agency, on the other, to present the objectives of the national energy management programme and to contribute, through its experts, the technical and economic information pertinent to the concerns of the participants;
- Seminar on renewable energy sources and energy conservation techniques, to which were invited responsible representatives of the sector, researchers and industrialists in order that they might be briefed on the state of the art in research into renewable energy sources and their applications in the United States of America.

In addition, Agency officials have taken part in economic, cultural and training events.

The preparation of information documents

In parallel with the measures taken to provide information and develop an awareness that have already been described, the Agency has prepared a number of documents, specifically the following:

- A leaflet discussing the essential elements of energy management and describing the functions of the Agency;
- A collection of regulatory texts regarding energy management;
- A leaflet on energy statistics;
- A document on "Energy Management: Origin and Development", describing the factors that have made it necessary to introduce the concept of energy management in Tunisia;
- A film on the rational use of energy in industry, explaining the various phases from the energy audit to the preparation of a contract programme;
- A film on renewable energy sources.

VII. PRACTICAL ACTIONS

Demonstration

The importance which the authorities attach to demonstration as part of the process of introducing new energy conservation techniques or of using new procedures in the area of alternative energy sources, and thus creating an awareness of energy management, has led the Government to borrow money for the purpose of financing the foreign exchange components required for the carrying out of demonstration projects.

This money has mainly been borrowed from the International Bank for Reconstruction and Development (IBRD), with the loans going specifically to the following projects:

Energy audits conducted under the "Technical Assistance" project,
IBRD loan No. 2197 TUN

This operation has involved the following six enterprises, which are major consumers of energy in the industrial sector:

ICM	Fertilizer branch
SAEPA	Fertilizer branch
SIAPE	Fertilizer branch
SCG	Cement branch
SITEX	Weaving and garment industry branch
SPBT	Brewery branch

These audits involve three phases:

Phase 1: Preliminary audit, identification of the enterprises;

Phase 2: In-depth audit;

Phase 3: Identification of the actions to be taken and the energy-saving projects to be carried out.

This project was begun during the second semester of 1986 and concluded during the first quarter of 1988.

Under it, for each establishment audited it was possible to prepare a plan of action setting forth the energy-saving measures and projects. These projects have been reflected in contract programmes concluded between the Agency and the enterprises involved in this programme. If all these energy-conservation projects were implemented, the result would be energy savings estimated at 16,800 toe/year through total investments in the order of 10 million dinars (equivalent to 9.5 million US dollars), 70 per cent of which in foreign exchange.

Energy audits conducted under the "Energy-Saving Measures Demonstration"
project, IBRD loan No. 2735 TUN

This operation involves five enterprises:

STIR	Refinery
CIOK	Cement plant
STIL	Dairy
Tunisie-Lait	Dairy
BAMI	Brickyard

This project was begun in May 1989 and will extend over a period of 14 months.

Basic training programme on energy audits, IBRD loan No. 2735 TUN

Training

Finance through an IBRD loan, a basic training seminar on energy audits and energy conservation techniques was organized for AME personnel, teachers, and engineers affiliated with the design offices and energy-intensive industrial establishments participating in the demonstration activities.

This programme covered the various basic aspects of energy audits and the study of the technical characteristics of different kinds of energy-consuming equipment - theoretical and practical on-site aspects - and was designed to establish a coherent procedural basis for common use by all future energy auditors.

The programme was carried out between the months of March and June 1988 and was scheduled for an actual period of 10 weeks.

Energy audit management

Audits

By the end of 1988, the Agency's technical divisions had recorded the performance of 13 energy audits in the industrial sector, not counting the two projects co-financed by the World Bank.

Contract programmes

Following the study and approval of the audit reports, AME begins work, in collaboration with the enterprises audited, on the formulation of an energy-saving programme, which then becomes the subject of a contract programme.

By the end of 1988, the Agency had negotiated and submitted to its Board of Directors eight such contract programmes.

For all of these enterprises taken together, the energy savings to be realized amount to about 20,000 toe/year for a total investment of 11 million dinars. The anticipated savings represent some 13 per cent of these enterprises' total energy consumption.