

Energy Efficiency Programme For Federal Public Administration Buildings

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ABSTRACT

Over the past ten years; the National Commission for Energy Conservation (CONAE), has excelled as an institution which provides energy options to the various sectors of Mexican population and other countries seeking to save and efficiently use energy as well as taking advantage of renewable energy.

CONAE's core functions have been: standardization, technical assistance and promotion. At the same time its evolution has allowed its programmes to reach a different level, by creating and putting into effect state-of-the-art technological tools on the Internet. CONAE has placed itself on the *avant garde* using the web to deliver technical assistance.

In mid 1996, CONAE began the programme One Hundred Public Buildings which was concluded at the beginning of 1999. The programme enabled CONAE to analyse around 900 thousand square meters in 98 buildings occupied by public sector entities. It made it possible for CONAE to identify potential sources for energy savings that averaged 20% of current consumption, which could amount annual savings up to 11 million mexican pesos providing investments reach the amount of 15.5 million pesos, replacing 98 thousand lamps.

CONAE's evaluations have given place to energy savings actions. Out of the 100 buildings under appraisal 34 of them are undergoing correction measures as suggested by the Commission. The SEMARNAP one million pesos investment in one of its premises is a case in point.

The programme, first of its kind at CONAE was designed to include in its actions building operators, having them participating in the data collection necessary to perform the evaluations. Likewise it gave the means to refine methodologies, working tools and data bases to be utilized on programmes of greater scope, it also allowed the identification of the most notable barriers that hinder the development of projects in buildings run by the public sector.

In a parallel fashion during 1997 and 1998, CONAE developed its technical assistance programmes and put in place a web page and a set of distance-learning training courses which include tools to operate the programs that have been developed.

Those activities have put CONAE on track with tools, expertise and a working capability to design and operate a more ambitious programme on buildings known under the heading, "Energy Efficiency Programme for Federal Public Administration Buildings".

OBJECTIVE

The objective of this program is to reduce power consumption levels in lighting systems of the Federal Public Administration Buildings.

SCOPE

The Programme focuses its work on the lighting systems of the Federal Administration Buildings, and will operate during 1999 and 2000.

In this sense, and according to the analysis resulting from 100 Public Buildings, any building with an area equal or above 5,000 m² and a annual electricity consumption of 60 kWh per m² must participate in the Programme.

GOAL

It is expected that the program will enable the analysis of 10 million square meters of offices which may lead up to a 100 million pesos energy saving on the electricity bill providing a 150 million pesos investment -at current value- is executed.

REGULATION

The budget austerity policy that prevails in the Federal Public Administration, gave birth to the publication of various executive orders and agreements that enhanced the development of the aforesaid programme. These agreements are:

- Executive order which enacts the Budget Austerity Programme of the Federal Public Administration for Fiscal Year 1999 (Official Gazzette of Federation February 22, 1999)
- Regulation that rules working days and schedules of the Central branches of the Federal Public Administration (Official Gazzette of Federation March 15, 1999)
- Agreement which establishes the General Guidelines to apply the Energy Savings Programme for Federal Public Administration Buildings (Official Gazzette of Federation March 16, 1999)
- Modernization Programme of the Federal Public Administration, 1995-2000. Make the Federal Public Administration an effective organization, efficient with a culture of providing services to meet the legitimate needs of society.

OPERATION SQUEME -Figure 1

- a. **Executive Level.** At this stage coordination and execution of the programme between the Technical Committee and Entities' Internal Committees is carried out.
- b. **Administrative Level - Operational.** At this stage coordination between the Entities' and Institutions' Representative Officer and CONAE is required in order to:
 - Observe and enforce guidelines
 - Buildings registration
 - Appointment of people in charge of the building, and
 - The issuance of data and outcome.

- c. **Operational Level.** At this level those in charge of the building will get trained in order to handle:
- The compilation of information
 - Methodology will perform physical data collection of the building, and
 - The transmission of CONAE's info through its web page.

SCHEME

The Energy Savings Programme has three working levels:

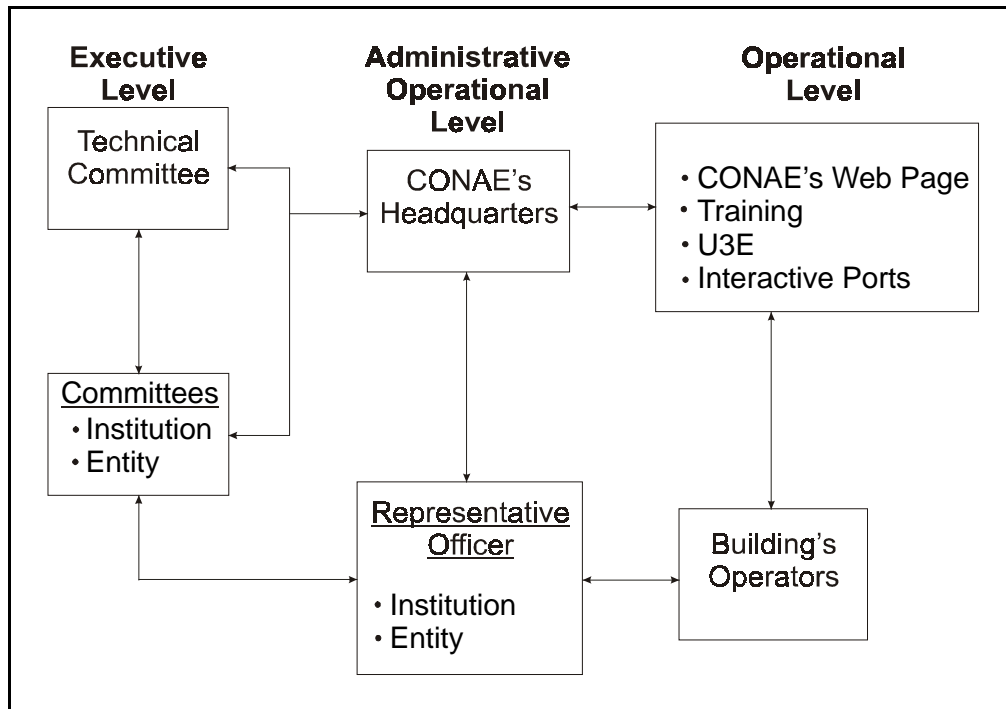


Figure 1. Operation Scheme

The programme is executed by CONAE, which promotes and provides training to different parties, provides data collection support, carries out data processing, releases final reports and provides fund raising assistance as well as the implementation of the suggested measures.

On the other hand, institutions are required to commit the facilities, provide data collection support, to hire (should it be necessary) specialized consultants on lighting systems, of investment on measures and report on actions taken.

To meet the needs of a far-reaching Programme, it was planned a structure on the Internet where its main activities are being carried out under the following scheme, figure 2.

In order to get a closer picture of those representatives attending training courses, a technical assistance section was developed where users have the opportunity to raise questions on the training elements or the functioning of the programme.

On the training section, candidates willing to attend any of the courses offered, could see venues, timetables, grades and dates set for second round exams to be made available to those who failed to pass.

Furthermore, on CONAE's web page there are sections where users are able to look the objectives, the operation mechanisms, progress and results of the Programme.

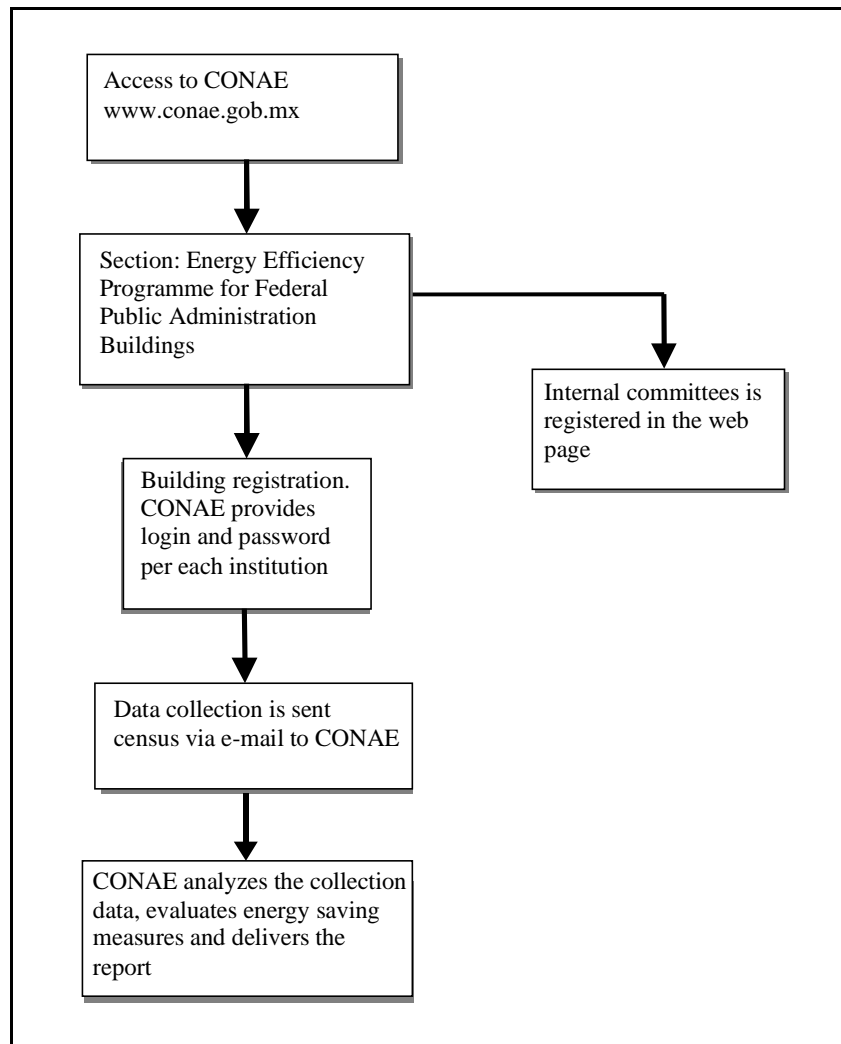


Figure 2: Technical assistance proceeding

ACTIVITIES

After almost one year's operation of the programme, 7 Workshops for Officers in Charge have been carried out, where 121 institutions have participated, four training courses were taught through the net of the Instituto Politécnico Nacional using distance learning capabilities and one using the PEMEX's net, 390 individuals were trained on data collection and the use of the data compilation tool that can be found on CONAE's web page on the Internet (<http://www.conae.gob.mx>).

Additionally, workshops with manufacturers, consultants and related associations to lightning energy efficiency were held. As a result of these workshops two working groups were formed, one made up by the Sociedad Mexicana de Ingenieria de Iluminación , (SMII), the Illuminating Engineering Society of North America, Sección México (IESNA), and FIDE

as special guest, which is in charge of elaborating the Guide of General Technical Specifications and evaluation criteria for materials and fluorescent lightning equipment and systems.

The second Group is formed by the Mexican Association of Technicians and Professionals on Energy Application, *Asociación de Técnicos y Profesionistas en Aplicación Energética* (ATPAE) and the Mexican Chamber of Consulting Firms, *Cámara Nacional de Empresas de Consultoría* (CNEC), both of them are endeavoring to certify consultant firms on technical and administrative aspects of the lighting program.

By mid March of 2000, ATPAE achieved 80% of its technical and professionals certification project. The certification process focused on several specialty branches such as: energy management, efficient lightning, thermal energy and cogeneration, demand control and air quality. The methodology developed by the Association is based on National Consulting Qualification Latin Professionals (NCQLP) and the Specification Administration Test (SAT) among others.

The CNEC certification programme has been running for 8 years. Its methodology, is based on FIDI/ISO or ISO9000 standards. The Chamber issues a verification document which proves the Chamber have confirmed background experience, economic ability, degree of automation, quantity and qualifications of personnel, capacity of facilities and skills of the certified company.

As a component of the training provided to building operators participating in the Programme, a symposium on the Lightning State of the Art in Public Buildings was held with the collaboration of the Lawrence Berkeley National Laboratory (LBNL) and a Mexican consultant. Some 130 experts attended.

Additionally, in February 2000 CONAE organized an event to deliver final reports and awards to participating institutions in the Programme under 8 categories:

- 1) **Outstanding Participation:** Ministry of Administrative Development and Control (SECODAM) for having fulfilled the activities of the Programme, since it established schedules, workshops and dates for training courses, as well as of censuses delivery, reports and progress.
- 2) **State of the art Technology:** Ministry of Energy (SE) and Ministry of Foreign Affairs (SRE). As a result of the analysis of the censuses it was detected that most of the installed equipment corresponded to T8 lamps and electronic ballasts.
- 3) **Success Story:** Ministry of Environment, Natural Resources and Fisheries (SEMARNAP) for having implemented CONAE's recommendations in its building resulting in energy savings up to 30% and 490,000 pesos per year.
- 4) **Participation in Training:** Ministry of the Treasury (SAT-SHCP) to its enthusiastic participation and enrolling 30 representatives in the training courses.
- 5) **Energy Conservation pioneer:** Mexican Institute of Social Security (IMSS) for its intense use of energy saving technologies and for keeping consumptions low.
- 6) **Participation and Promotion:** Office of the General Attorney (PGR) for its dissemination and promotion campaign.

- 7) **Special Award:** Federal Electricity Commission (CFE) and National Politechnical Institute (IPN) for having organized distance-learning training courses.
- 8) **Energy Savings Campaign:** Mexico's Oil Company (PEMEX) for its thorough campaign known as SIASPA, which envisages to reach 5% savings in its energy consumption.

In this event CONAE also informed representative Officers that the main objective for 2000 will be to reduce at least 20% of its electrical energy consumption index as compared to 1998 records. Likewise, they were handed a file which contained a series of support documents: regulation basis, technical recommendations, technical guides, procedures and the subject-specific.

PROGRESS

Until February 2000, 347 buildings representing of 2.5 million m², show on energy average index of 107.83 kWh/m² per year, which is 1.8 times higher than the established on Article 3rd of the Agreement of the Programme.

From these 347 registered buildings, 232 buildings have been analyzed, representing a built surface of 1.88 million square meters and 294,912 systems installed, of which 90,131 are likely to be changed. The potential savings would be 14.8 GWh/year and 14.9 million pesos, given 27 million investments.

PLANS

Next year goals of the Programme will include as another component of the objectives, training in air conditioning systems, lighting and pumping -which represent the highest energy consumption in buildings- through technical workshops that will be taught in collaboration with equipment manufacturers and academic institutions.

As for upcoming activities, CONAE experts will continue to reinforce certification of consulting firms in order to ensure quality on the work performed. This task will be undertaken with the assistance of CNEC and ATPAE management.

One of the most important activities is to overcome the administrative barriers to bring Energy Service Companies to participate in the programme. Such activity will be analyzed by a Group of official representatives of participating Institutions and Entities enrolled, since the barriers stem mainly from legal administrative matters.

To ensure the success of the programme in the efficient equipment acquisition, CONAE will work in the elaboration of governmental purchasing guidelines (green purchases). LBNL will provide assistance and advise during this stage.

Together with SEMARNAP and the National Ecology Institute (INE), CONAE will develop specific regulation measures for waste disposal, given the lamps and ballast substitution to be made by participating institutions.

CONCLUSIONS

The One Hundred Public Buildings Programme has been successfully outsourced by having analysed two times the quantity of buildings in a shorter period of time (one third) and by making Federal Public Administration participation mandatory.

The Programme has also achieved a measure goal of the reduction of electricity consumption index in participating buildings.

The programme establishes clear rules for the participation of consulting firm and/or manufacturers of lightning equipment.

This Programme shows a solid progress toward energy efficiency in México, and its likely to be the only far-reaching energy efficiency Programme addressed to the governmental sector of Latin American countries.

