



**ENERGY AUDIT RESULTS OF THE SOUTH PACIFIC APPLIED
GEOSCIENCE COMMISSION HEADQUARTERS IN SUVA, FIJI ISLANDS**

**SOPAC Miscellaneous Report 439
August 2001**

FOREWORD



Alf Simpson

Despite the high costs associated with imported petroleum products into our small island states, energy efficiency and energy conservation remains in its infancy. There is minimal awareness amongst the public, government and non-government institutions in the region on the monetary and non-monetary benefits of energy efficiency and energy conservation programs.

The development of energy efficiency and energy conservation policies are an essential component for the economic and environmental development in the region as this assists in reducing, the

- (a) increasing loss of foreign reserves in importing fossil fuels and
- (b) the level of greenhouse gas emissions.

With the presence of the regional energy program at SOPAC, it was appropriate to take a lead role in demonstrating energy efficiency and energy conservation measures at its headquarters located in Mead Road, Suva, Fiji Islands. This report documents the methodology adopted and benefits of such an initiative that would enable member country energy offices and other interested parties to conduct similar programs in their respective countries.

A handwritten signature in black ink, appearing to read 'Alf Simpson', written over a horizontal line.

Alf Simpson
Director

SUMMARY

Energy efficiency and energy conservation programs are an essential component for the economic, environmental and social development of Pacific Island countries. The ultimate goal of such programmes is to eliminate energy wastage and reduce the amount of money spent on electricity bills. But where are the areas of wastage? They may not always be immediately apparent and they can vary from one sector to another and from one location to another.

This paper summarizes the various phases of an Energy Audit conducted by the South Pacific Applied Geoscience Commission (SOPAC) Energy Unit at the SOPAC Secretariat Headquarters in Mead Road, Nabua, Suva, Fiji Islands. The approach taken was to establish a demonstration project and to develop a methodology that would be applicable for adoption in SOPAC member countries.

The exercise also served as an energy conservation and awareness campaign at the SOPAC Secretariat with the primary objective of reducing electricity consumption within the Secretariat through in-house education and improved housekeeping measures.

The campaign focused on a commercial-type application where the energy used at the SOPAC Headquarters is only in the form of electricity for lighting, air conditioning and office equipment. Electricity is supplied by the Fiji Electricity Authority (FEA) grid and a 1.0kW solar powered backup system for telecommunication and security lights. The average consumption of electricity at SOPAC is approximately 14.6 MWh per month, resulting in a monthly electricity bill of around F\$3200.00 (US\$1376.00)¹. The energy audit identified the quantity and the specific use of electricity at SOPAC and recommended approaches and procedures, without incurring dollar costs to the Secretariat, to reduce the consumption of electricity by eliminating waste and improving efficiency.

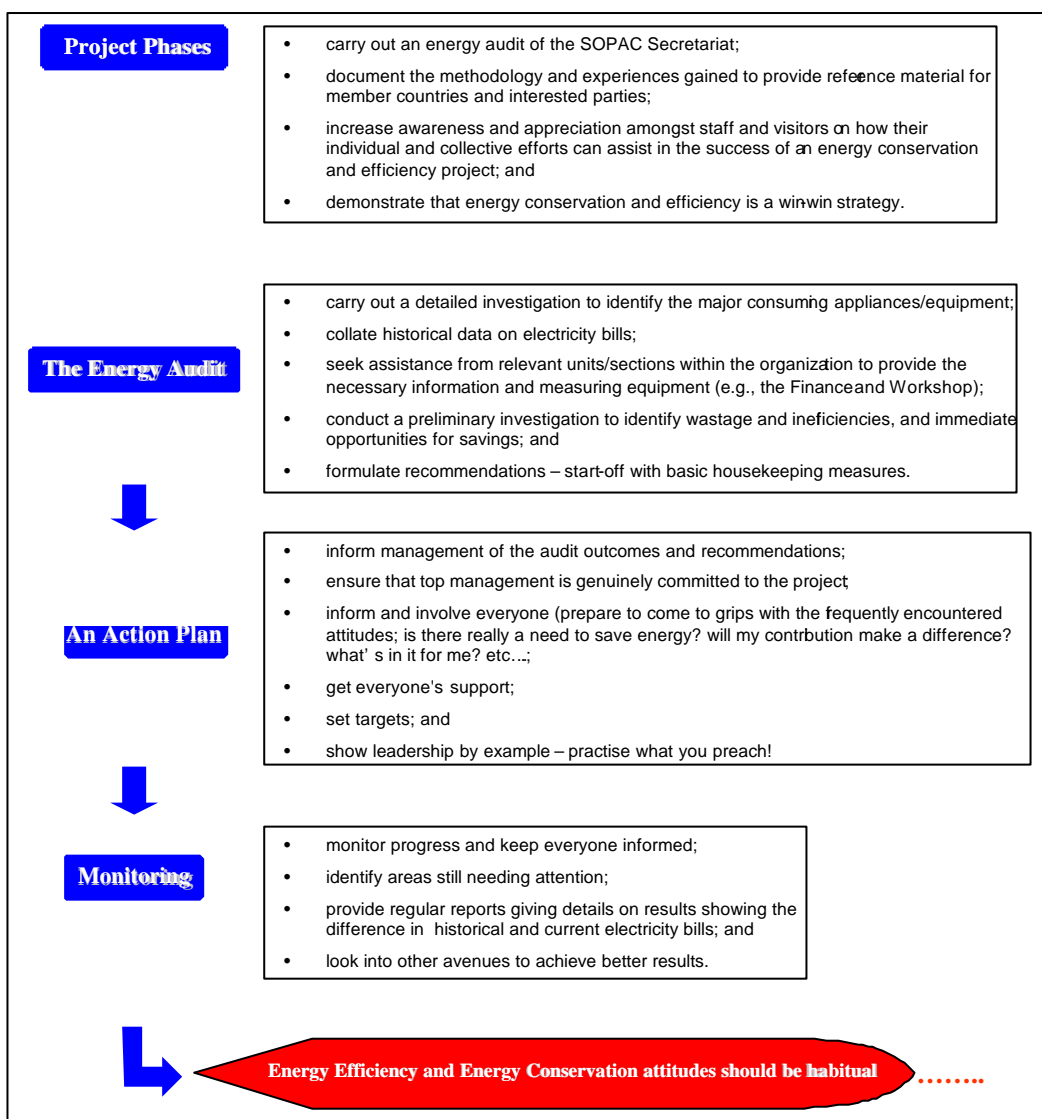
The energy audit recommendations focused on the major consuming areas of air conditioning, computers and lighting, highlighting the following immediate opportunities to conserve electricity:

- ensure that electricity-consuming equipment are either switched into their power saving modes or switched OFF during periods of non use;
- use thermostat settings of the air conditioners to adjust room temperatures for comfort;
- ensure that doors and windows are closed when air conditioners are in use;
- computer monitors are to be switched OFF at the end of the working day; and
- lights, fans and air conditioners are switched OFF when not needed.

Following the implementation of these housekeeping measures, the savings over the five month period accumulated to F\$1621.00 (US\$697.00) with a major portion of this being attributed to the reduced use of air conditioners.

¹ At an exchange rate of 0.4300

THE PROCESS



Full details on the energy audit are available in *SOPAC Miscellaneous Report 393, June 2000*.

RESULTS

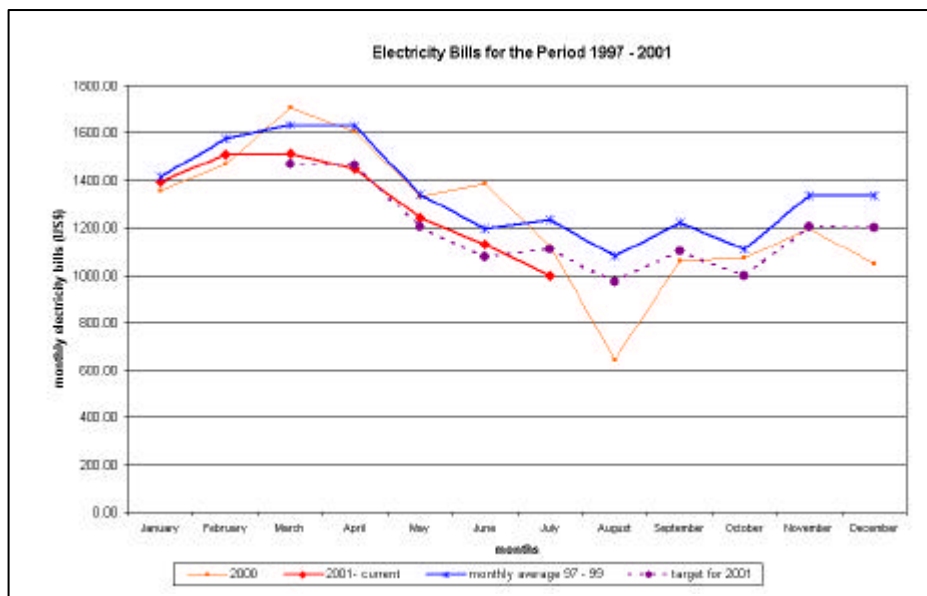
The implementation of recommendations² from the energy audit commenced in March 2001. Electricity bills in the subsequent months showed savings, as presented in the linegraph below. The targeted savings per month (dashed line-graph) were estimated at 10% reduction from an average over 1997 to 1999. It is noteworthy that the electricity bills for 2000 have been plotted separately and are not included in the monthly average consumption. The very low consumption over the period June – October 2000 was due to the disruptions in power supply resulting from the May 19th coup. This demonstrates the importance of analyzing historical data correctly noting any changes in operation or supply of electricity that could create a bias and incorrect trend. Incidents such as these need to be well documented.

The savings over the months of March to July 2001 accumulated to F\$1621.00 (US\$697.00), compared to the corresponding monthly average of 1997 to 1999 electricity bills, and F\$1902.00

² housekeeping measures such as switching off appliances during periods of non-use, keeping doors and windows closed when using the air conditioner, etc.

(US\$818.00) compared to the same period in 2000. It is notable that these savings were achieved at no capital investment cost to the Secretariat.

User attitude interestingly changed with everyone being more conscious of electricity usage on the premises. This was achieved by the continuous reminders and updates on progress made. This approach makes everyone feel part of a successful team effort.



Graph showing the current electricity bills as compared to that over the past 4 years

LESSONS LEARNT AND ITS APPLICABILITY TO THE REGION

The importing of petroleum products for use in the electricity-generation sector in most Pacific island countries is placing an increasing strain on their small economies. The relatively high costs associated with fossil fuels have led to increased interest in reducing fossil fuel consumption through the development of energy efficiency and energy conservation programs in the region.

These programs are not new to some Pacific island countries. For instance, the Fiji Department of Energy's Conservation Project at the Commissioner Central Office building made a savings of F\$1182.00 (US\$508.00) over 6 months. In the Solomon Islands, an Air Conditioner Efficiency Project conducted in 1998 produced excellent results with an annual savings of SI\$39553.00 (US\$9230³).

The demonstration project at the SOPAC Secretariat shows that energy efficiency and energy conservation programs can begin without capital investment costs to the institution. With proper planning and effective leadership, the exercise can easily be carried out in-house through education programmes and the use of common sense.

The success of such programs over the years only reaffirms the appropriateness of continuing such initiatives in the Pacific region. Increasing the scope of the project to consider measures such as changing lighting systems, installation of timer switches for air conditioners, etc, will need at least some initial financial investment, which usually has a payback period of 1 to 2 years.

It is anticipated that in-house good governance projects such as these, that demonstrate a willingness to bring about a change for the better will attract funding assistance from potential donors when the need arises for major work requiring capital investment, to further the cause of energy efficiency and energy conservation in the Pacific islands.

³ at an exchange rate of 0.2334