

Australian Standard[®]

**Guidelines for reporting energy
use as part of the energy audit**

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PREFACE

This standard was prepared by the Association's Committee on Energy Audit following a request, on behalf of the Australian Minerals and Energy Council's Coordinating Committee on Energy Conservation, from the Department of Resources and Energy, to assist in the National Energy Conservation Program.

This standard covers reporting energy use, which is a part of the energy audit, which itself forms part of an energy management program. An energy management program includes the following steps—survey and measurement of energy use; reporting of energy use (covered by this standard); analysis of reported data, selection of a plan of action for energy conservation; implementation of selected measures; and monitoring of the energy use. The first three steps constitute energy audit. It is proposed to prepare standard guidelines covering all the above steps of an energy management program, to provide guidance to various sections of government and industry in this important area of energy conservation.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

GUIDELINES FOR REPORTING ENERGY USE AS PART OF THE ENERGY AUDIT

1 SCOPE. This standard provides guidelines for reporting energy use and costs as part of an overall energy management program.

2 OBJECTIVES OF ENERGY USE REPORTING.

The objectives of energy use reporting covered in these guidelines are—

- (a) to show the amount and cost of each form of energy used over a nominated period; and
- (b) to establish a base for both patterns and quantities of energy use from which subsequent comparisons can be made.

3 APPLICATION. This standard applies to the procedures and units for measuring and reporting energy use such as in institutional, commercial and industrial applications.

4 DEFINITIONS. For the purpose of this standard, the following definitions apply:

4.1 Energy—the (gross) calorific value of fuel types and energy sources accepted at the point of delivery of the operating site.

NOTE: Fuel types and energy sources include electricity, natural gas, fuel oil, heating oil, diesel oil, LPG, petrol, automotive distillate, coal, coke, briquettes, wood, sawdust, bagasse, wind power, biogas and solar as well as purchased heat.

4.2 Energy system—an installation or process for which an energy balance or activity rate can be assigned.

4.3 Energy audit—the periodic survey, measurement, reporting, analysis and examination of an energy system (or part of the energy system).

4.4 Energy budget—the estimated expected energy use and costs for an installation or process over a selected period.

4.5 Energy input—the total energy supplied to an installation or process from all energy sources.

4.6 Energy management program—a program for the monitoring and control of energy use.

4.7 Output—the measure of the benefit or of the goods produced by the energy used.

4.8 Specific energy use—the energy use per unit of desired output.

5 REPORTING ENERGY USE AS PART OF THE ENERGY MANAGEMENT PROGRAM. An energy management program involves the orderly control of energy and includes the following steps (designated Step 1 to Step 6):

Step 1. *Survey and measurement of energy use* of the installation or process.

Step 2. *Reporting of the energy use* of the installation or process.

Step 3. *Analysis of the reported data* for the installation or process in order to determine energy conservation opportunities.

Step 4. *Selection of a plan of action* with the aim of minimizing the cost of energy input with respect to desired output, and to express this plan in an energy budget.

Step 5. *Implementation of selected energy management measures.*

Step 6. *Monitoring of the energy use* (of the modified installation or process) *against the estimated energy budget* to ensure that potential energy savings are realised on a continuing basis.

These steps are illustrated in Fig. 1. Steps 1, 2 and 3 constitute the 'energy audit' which then becomes the basis for further development (Steps 4, 5 and 6) of an energy management program. The energy management program should aim at optimal energy usage within the application to which the program relates, in terms of minimizing the cost of energy input with respect to the desired application output.

The energy use to be measured is that associated with the direct use of fuel types at the operating site. Examples of fuel type are electricity, fuel and diesel oil, natural gas, coal and wood. The energy content of waste materials such as residual oils and bagasse should also be measured when used as a fuel source.

For all these fuel types only the energy delivered to the operating site is to be counted. The energy associated with the processing and delivery of the fuel type, and with the provision of equipment and materials at the operating site, is excluded. However, energy consumed in the processing for use, storage or transport of fuel or materials on-site should be included, as also should the energy used in the transport of output to the consumer when these costs are part of the company delivery costs.

Application output can be defined in terms of the desired output from the application, e.g. the output of desired goods, such as goods manufactured for sale; or the provision of the requisite services, such as maintenance of a satisfactory thermal environment within leasable office space.

Measured energy input should be directly related to a fixed unit of output in order to provide a meaningful measure of energy efficiency. This relating of measured input to the relevant output parameters is the second part of the energy reporting guidelines addressed in this standard.

It may be found desirable to separate the fixed and the controllable elements of energy use and cost, in order to emphasise opportunities for conservation.

The information on energy use provides the raw data for analysis of energy use in the plant, process or application under review. Such analysis should aim at determining where the significant energy forms are being used, what effect changes in fuel source, process or application would have on energy usage per unit of output, and on energy costs per unit of output. This approach involves examination of a range of alternative energy conservation measures, some of which may merit implementation as part of the overall energy management program, with a view to a reduction in energy usage.

This standard deals only with the step in the total energy management program dealing with reporting of energy use.

NOTE: It is proposed to prepare other Australian standards providing guidelines on other steps in the energy management program.