



ENERGY MASTER

Becoming an Energy Master Auditor Applicants Guide

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1. Overview

This document sets out the process for those wishing to seek Accreditation as an **Energy Master Auditor**.

The minimum requirements for Energy Master Auditor include the applicant demonstrating to the Auditor Assessor(s) that he/she has general competence in comprehending technical concepts and applying systematic engineering methods to energy auditing.

The Australia / New Zealand Standard in Energy Auditing (AS/NZS 3598:2014) is used as a basis for outlining the requirements of any Type 2 - Detailed Energy Audit submitted for assessment.

2. Competence Requirements

Applicants will be required to demonstrate general and specific energy auditing competence in relevant engineering practice fields, so as to be able to:

1. Comprehend and apply knowledge that underpins good practice in the technical aspects of industrial and commercial processes;
2. Identify, state and analyse industrial and commercial systems problems and risks in accordance with sound engineering methods;
3. Develop and articulate clear and well-founded solutions to industrial and commercial systems problems, by using systematic procedures and sound judgment; and,
4. Communicate clearly with others in the course of his/her business activities, including the ability to work objectively with large and medium-sized commercial and industrial organisations to facilitate positive change (e.g. improved energy efficiency).

3. Work Experience

Applicants are expected to have specific competence and experience in the review and analysis of the energy performance of a commercial or industrial building and comprehending the technical concepts and applying systematic engineering methods to energy auditing relevant to New Zealand industry.

Auditor assessor(s) will require details of an applicant's recent significant practical work experience in the commercial and/or industrial auditing energy use.

Applicants should list, in chronological order, details of their project and work history using the work history summary section in the application form. Details should include:

1. Recent employers and the nature of the type of work undertaken; and
2. Specific details of work done, including the date, client, and details of each audit or energy management/improvement work done.

4. Academic and Practical Requirements

While there are no strict qualification pre requisites to apply for Energy Master Auditor, applicants are strongly advised to have gained a 2 year or higher tertiary qualification in an appropriate field. Typical qualifications are NZCE, National Diploma in Engineering (level 6), Technology Degree, Building Science Degree, Engineering Degree and so on. Appropriate fields include:

- Building services
- Electrical
- Industrial
- Mechanical
- Chemical
- Control Systems

Any other fields involving energy usage will also be considered.

Applicants are also required to demonstrate achievement of sufficient practical experience in a suitable field to enable them to apply the academic knowledge they have gained. Membership of Engineering

New Zealand or other technical body at associate, technical or professional level or registration on a register of current competence (CertETn, ETPract, CPEng etc) would satisfy this requirement.

Applicants should note that it is usual for new graduates to have acquired a minimum of 5 years experience in a suitable field to gain sufficient experience to be able to satisfy this requirement.

5. Sample Type 2: Detailed Energy Audit Report

Applicants are required to submit a Type 2: Detailed Energy Audit ('investment grade' for commercial buildings) audit report or reports substantially carried out by him or her which demonstrate their knowledge of energy auditing as defined in AS/NZS 3598.1:2014.

The audit report(s) must meet the requirements for a Type 2: Detailed Energy Audit Energy Audit as defined in AS/NZS 3598.1:2014 "Energy Audits" and must include an analysis of the following:

- Site energy management programme;
- At least three different energy end-uses (e.g. lighting, heating); and
- An explicit energy balance.

The site chosen must be of significant size in terms of its energy consumption. As a guide the energy expenditure should be over \$100,000 per annum or alternatively the audit can be a detailed analysis of a cluster of smaller sites which combine to have significant energy use well above this threshold. Usually one report is sufficient but if necessary, more than one report can be submitted to demonstrate the required minimum of three energy end uses.

Note that all submitted audits are treated as commercial in confidence.

6. Referees for Assessment Purposes

Applicants are required to provide the details of two referees who are sufficiently familiar with the applicant's work to provide comment on the applicant's competence with regard to energy auditing.

Referees must be independent ie. not personally related to the applicant and not expected to gain materially if the application is successful (the applicant's employer may be a nominated referee, provided the interest in the outcome is professional and not personal).

It is recommended that applicants provide the main client of the submitted audit as a referee.

7. Tips for a Successful Application

Experience has taught us that assessing applications can be a time consuming business and has sometimes involved numerous requests to the applicant for more information to allow the audit to be evaluated properly. This has resulted in unsustainable time over-runs on assessments.

Consequently, applications are now only assessed on the basis of evidence initially presented by the applicant, and if the information does not enable an assessment to be made, the candidate will be failed. In exceptional circumstances, CEP may allow the assessor to contact the applicant once to seek further information, but this may involve the applicant covering the extra costs for time needed to complete the assessment.

The best advice for applicants submitting material for assessment is to put themselves in the position of the Assessor. This is particularly easy given that the Auditor Assessment Form is available which sets out what the Assessor is looking for.

Reference to the assessment form and the model energy audits (also available on the CEP web site) should provide guidance as to what energy end-users are appropriate. Supporting calculations are of critical importance. They should be included in your assessment and be made quite explicit. See Appendix A of this document for an example of an energy savings calculation expected to accompany any recommendations in an audit submitted for assessment.

Where you do not have an audit that includes energy management and three energy end uses, you can submit two or more audits to cover the required number of energy end uses. However, if you do this it is essential that you indicate on the application form which is your primary audit and what end-users are to be assessed in any supplementary audits.

We recommend you run through the assessment form, filling in the boxes with information from the audit you have chosen as you go. This procedure will quickly highlight any information that is lacking in the audit and provide you with a chance to remedy it and giving yourself every chance of a pass.

The assessment form is written for assessing audits that follow the form of the model examples audits to be found on the CEP web site. If your audit does not follow this form the assessment process is more difficult, as the assessors will be unfamiliar with the layout.

Score your own work. If the marks you have given yourself are insufficient to obtain a pass then the audit needs modification.

When you submit your audit after successfully completing this process you can be reasonably confident of a satisfactory and speedy result.

8. Reaccreditation 5-yearly

Accreditation as an Energy Master Auditor has a validity of five years. After this period an Energy Master Auditor needs to apply for reaccreditation to maintain their Energy Master Auditor status.

To apply for reaccreditation please complete and submit the Reaccreditation Form, which includes a Continuing Professional Development section (CPD), as part of the reaccreditation process.

For reaccreditation, the minimum evidence requirements consist of:

- Evidence of at least 20 hours (annually) of continuing professional development in areas relevant to energy auditing and professional development generally;
- Details of three Type 2 / Level 2 Energy Audits completed by the auditor in the previous 5 years, one of which was completed in the previous 18 months. Note: Level 2 Energy Audits dated after 1 April 2015 will not be accepted; and
- A full copy of one Type 2 Energy Audit.

The details of the other two audits are to include the date of the audit; a summary of the findings including the energy saving opportunities, the recommended courses of action, and the name and contact details of the client who received the report.

With respect to continued professional development (CPD), Energy Master must demonstrate undertaking of activities that contribute to their understanding and maintenance of their general and energy skills. 'Quality of content' rather than 'quantity of hours spent' is the key measure of suitable professional development.

Activities eligible for CPD points will include anything related to the individual becoming more effective in their role as an Auditor. Professional development can include courses such as marketing, accounting, customer service skills, and project management.

9. Ethical Conduct Requirement

An Accredited Energy Master Auditor is expected to conduct his / her energy auditing activities according to ethical standards generally accepted in New Zealand business and in line with the CEP Code of Ethics as follows:

- Members shall ensure that their claims for performance of products, provision of services and expertise are accurate, substantive and independently verifiable.
- In carrying out their activities Members shall ensure that commercial practice, standards and public statements reflect and maintain the highest standards of integrity and consideration for their clients and the public welfare.
- Members shall continue the development of their knowledge, skill and expertise throughout their careers and shall actively assist and encourage those under their direction to do likewise.
- Members shall so order their conduct as to uphold at all times the high reputation of the Association.
- Members shall not injure or attempt to injure, whether directly or indirectly, the reputation, prospects or business of another.

Accreditation may be rescinded by CEP if, following a fair and impartial hearing of the parties affected, CEP considers that the Auditor's behaviour has not met these standards.

Appendix A - Example of an Energy Savings Calculation

The following is a hypothetical example of an energy savings calculation performed as part of a Type 2 Energy Audit.

When submitting an Audit for assessment, you should supply calculations to the equivalent level of detail as shown in this example to allow an assessor to see your working.

Recommendation: Consider a Timer on Commercial Kitchen Extractor Fan		
There is potential to eliminate this heat loss during hours when the kitchen is unused. Switch off the fan at night, giving a significant reduction in heat loss from the building at night, due to less air exchange.		
Assumption	Comments	Reference
Exhaust airflow: 2 cu.m/sec	Product of measured area (1 cu.m) and measured air speed (2 m/s)	
Fan operates 8760 hrs/yr	Appeared to when witnessed on site	
Fan draw: 500W	Estimated on site by size	
The fan should be turned off from 10pm to 6am	The kitchen is closed and there is no cooking taking place at this time	
Heating degree days: Below 18 °C: 2100	According to Met office statistics for Bloggsville. The difference between the degree days gives us the energy savings	
40% of the degree days occur at night	Conservative estimate based on 8 hours of the day (a third of the time) and an allowance for colder weather at night	Estimate
Gas heating energy price: 4.43 ¢/kWh	As outlined in the energy pricing details	From Invoices
Average electricity price: 2.6 ¢/kWh	Almost all the electric energy savings would come at the lowest cost time for electricity (night), and would not affect the peak electrical demand at all.	From Invoices
A timer costs \$500	A seven day timer would be more suitable as it is more flexible for changes in operating hours	Quotes

The heating energy savings can be calculated as:		
The exhaust airflow:	2	m/s
x the specific heat of air	0.335	Wh/m ³ C
x the number of seconds per hour:	3600	s/hr
x the number of hours per day:	24	hrs/day
x the number of degree days/ year for Bloggsville	2100	C days/yr
x a conversion factor for Wh to kWh	0.001	
x the percentage of degree days that occurs at night	40	%
Calculated heating energy savings:	48,626	kWh/yr

These savings would come at the delivered gas heat price:	4.43	c/kWh
Annual heat energy cost savings =	\$2154	/yr
<i>Also the fan electricity savings would be:</i>		
The fan draw:	0.5	kW
x the duration of the avoided load	8	Hours/day
x the number of days the fan operates	365	Days/yr
Annual electric energy savings =	1460	kWh/yr
X average night time, energy only electricity price	2.6	c/kWh
Annual electricity cost savings =	\$38	/yr
<i>Therefore the total energy cost savings would be:</i>		
Heating savings	\$2154	/yr
Plus fan savings	\$38	/yr
Total annual energy cost savings=	\$2192	/yr
<i>The simple payback would be:</i>		
The cost of the timer:	\$500	
÷ The dollar savings per year	\$2192	/yr
Simple payback =	0.23	years