Background Report and Discussion Paper

for the preparation of a

National Course Framework

for NatHERS 2nd generation software tools

Prepared by

the Association of Building Sustainability Assessors

for

the Australian Greenhouse Office

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ABSA Inc

Level 2 Sydney Building Information Centre
525 Elizabeth St Surry Hills NSW 2010

Principal consultants:

Bernard Hockings, ABSA President
Leonie Johnson, ABSA Training Manager

Phone: (02) 8303 0566
Fax: (02) 8303 0565
Email: b.hockings@absa.net.au

Australian Greenhouse Office

John Gorton Building
GPO Box 621 Canberra ACT 2601

Project Manger:

Stephen Berry, Assistant Manager
Buildings, Finance & Government Team

Email: Stephen.Berry@deh.gov.au

Introduction

The Nation-wide House Energy Rating Scheme (NatHERS) was developed cooperatively and endorsed by all Australian Governments to encourage improvements in the energy performance of buildings through the use of thermal performance assessments.

The role of thermal performance assessments of residential buildings has been well established through State and Federal Government regulatory requirements. This role is likely to expand considerably as minimum performance requirements are raised and as consumer awareness of the benefits of high performance buildings grows.

New assessment tools

Assessors throughout Australia use a range of thermal performance assessment tools (TPAT). The Australian Greenhouse Office, in the role of National Administrator of the NatHERS scheme, has overseen CSIRO's development of an improved assessment tool, Accurate, due to be released later this year. It is envisaged that additional second generation assessment tools will be developed by private enterprises, based on the calculation engine utilised by Accurate.

Assessors

In NSW and Victoria alone there are over 40,000 residential building thermal performance assessments conducted annually. The annual value of assessors' services alone is currently in the order of 5 to 10 million dollars.

Assessors combine specialist knowledge and skills to provide their clients with both assessments and advice. There are two main variables determining the accuracy and value of thermal performance assessments: the capability of the assessment tool and the assessor's ability. The level of development of an assessor's knowledge and skill can have significant bearing on both the performance achieved and the cost of achieving that performance. The range of outcomes, determined by the assessor's abilities, may vary from achieving minimum required performance by unnecessarily expensive means, to achieving best practice at minimal or no additional cost.

Assessors are able to:

- reduce housing costs through achieving thermal performance targets at lower cost than would be incurred through meeting the requirements of less flexible "Deemed to Satisfy" regulations;
- save homeowners hundreds of dollars annually on energy costs;
- reduce national heating and cooling related greenhouse gas emissions by tens of thousands of tonnes per annum.

The introduction of new assessment tools and the increase in their use and impact, provides a timely opportunity for defining, on a national level, the skills and knowledge that are appropriate for assessors, so that the industry can:

- better demonstrate quality and rigour to its customers;
- optimise performance and cost outcomes.

Training

The AGO is managing the development of a national training program to be released concurrently with the launch of Accurate. ABSA has been contracted by the AGO, to develop, in consultation with stakeholders:

- a course framework that sets out assessor competencies and assessment criteria - defining the skills and knowledge that assessors should be able to demonstrate to accreditation bodies, regulators and consumers;

- training materials, teaching aids and learning strategies required for the delivery of training for these competencies, other than software operation (software operation training resources are to be provided by the software developers and distributors.)
- examination material for all competencies.

National Course Framework

At present, Australian states and territories have varying requirements for building thermal performance assessments as well as differing processes for assessor training, examination, accreditation and auditing. The role of the Course Framework can be to provide regulators and accreditation bodies with a definition of the core skills and knowledge required of assessors to be competent at undertaking assessments and providing advice. Regulations and accreditation schemes could incorporate, or be built around, these core skills and knowledge.

Agreement between states and territories on the essential skills and knowledge required for thermal performance assessors could:

- assist the establishment of reciprocal accreditation between jurisdictions;
- rationalise resources allocated to developing training requirements.

The Course Framework could be used:

- by accreditation bodies to determine:
  - criteria for accrediting training organisations
  - criteria for determining whether an assessor has completed sufficient training
  - criteria for assessing prior learning and experience for assessors
  - examination content;
- by regulators (if separate from accreditation bodies) to specify the minimum requirements for accreditation to meet regulatory requirements;
- by trainers to establish a course or courses for assessors.

The Course Framework will be most useful if it provides a flexible and adaptable approach to defining essential skills and knowledge.

The preliminary Course Framework (Attachment 1) has been compiled as an *example* of how skills and knowledge for assessors can be defined. It is a first draft, based on issues identified through a preliminary survey of a number of stakeholders around Australia. A summary of the survey results is included (Attachment 2).

Review and input from a wide range of people will improve the applicability of the Course Framework and will be fundamental to ensuring that its content is relevant and useful.

This Background Report and Discussion Paper is the starting point in the development of the Course Framework. It aims to initiate discussion and seek input from key industry stakeholders, on the content and application of the Course Framework.

The next steps

Please review this document and forward your comments, by Monday 31 May 2004, to:

Bernard Hockings, email: b.hockings@absa.net.au

If you wish to discuss any issues, please phone Bernard (02) 8303 0565 or 0438 556378.

Issues discussion

The following issues are proposed for discussion in order to determine their importance and to assist development of consensus amongst stakeholders. The issues below are not an exhaustive list, rather a starting point for discussion – it is hoped that comments will address these issues as well as suggest others for discussion.

Note: The issues listed below relate largely to accredited assessors. It is acknowledged that assessments will be undertaken outside the accreditation framework.

Context

1. What mechanisms, within each state and nationally, can encourage or require assessors to comply with the competency requirements? e.g.:
   - a pre-requisite for complying with assessor accreditation requirements defined by building regulations
   - "evidence of suitability" for submitting assessments through the BCA Verification Method
   - promotion of complying assessors by national and state regulatory, accrediting and advisory bodies.
2. What would be required to maintain a nationally consistent Course Framework e.g. maintenance and distribution of the Course Framework would be the responsibility of the National Administrator of the Nation-wide House Energy Rating Scheme – the state and territory administrations could offer a commitment to adopt the national training requirements.
3. Is there value in this course being offered, at a later stage, through the Australian National Training Authority's Australian Qualifications Framework? (for further information refer to www.anta.gov.au)

Required skills and knowledge for thermal performance assessors

What does an assessor need to know, and be able to do, to accurately and consistently assess the thermal performance of building designs and provide advice for improving ratings?

The Draft Course Framework *(Attachment 1)* has been developed as an example, to demonstrate how the required skills and knowledge could be described. This Draft Course Framework has been based on three broad areas of competency as a starting point for discussions:

- thermal performance theory
- software use
- regulatory requirements and procedures.

4. Do these broad areas of competence encompass the skills and knowledge that are required of assessors?
5. What level of understanding of thermal performance theory do assessors need? Is use of an assessment tool alone sufficient for producing and improving ratings?

The Draft Course Framework *(Attachment 1)* lists Elements and Performance Criteria for each competency, which define examples of the skills and knowledge that an assessor may be required to demonstrate.

6. Are the Elements and Performance Criteria included in The Draft Course Framework *(Attachment 1)* necessary? Are there others that should be included?
7. Is there any value in defining some of the skills and knowledge as prerequisites to any training? Suitable pre-requisites to recommend might be the ability to read plans and basic computer skills. How could suitable levels of pre-requisites be determined?

Application

8. As is often the case with industry based training, there is considerable tension between the amount of knowledge that trainers and accreditation bodies need to incorporate into training, and industry concern over the cost and time involved in training.

   While the Course Framework would not specify how delivery should occur, there is scope to include suggestions for delivery or recognition of prior learning. For example, accreditation bodies could use a combination of examinations, accredited / recognised training and ongoing professional development and update courses to allow assessors to demonstrate their suitability for accreditation in a variety of ways. Are any of the skills and knowledge listed in the previous section suited to certain types of delivery or examination (for example, is learning how to use software suited to correspondence)?

9. While the Course Framework would not specify the duration of any course or courses that may be developed to deliver the agreed skills and knowledge, would there be value in assigning indicative minimum durations to some or all of the agreed skill and knowledge requirements?

10. Given the varied levels of existing skill and knowledge that assessors are likely to have, are there different levels of accreditation that would be more appropriate? Could an assessor be accredited for basic assessments only and then apply for a higher grade of accreditation at a later date? If so, should the course framework differentiate between the skills and knowledge required to undertake simple assessments (e.g. BCA Class 1 buildings) and the skills and knowledge required to undertake complex assessments (e.g. BCA Class 2 buildings)?

What skills should trainers have?

11. There is scope within the Course Framework to indicate minimum levels of experience, qualifications, knowledge or skills of trainers for a given area of competence. Should any of these be specified for trainers?

12. What methods could be used for ensuring trainer quality?

Draft Course Framework

The Draft Course Framework *(Attachment 1)* has been developed to provide a basis for discussions, to assist in resolving the issues set out above.

A Course Framework is not a description of training – it is the basis for developing training. A trainer would take the Course Framework and develop learning outcomes, modules and training programs around each of the competencies. (Some of these resources are being developed as part of ABSA's scope of works.) Also, an accreditation body could allow assessors to demonstrate competencies by a variety of means.

Note: It is important when adding or changing any of the performance criteria that only criteria which are able to be demonstrated are used. For example, compare "Understand how the use of materials can influence the thermal performance of a building" with "Explain how the use of materials can influence the thermal performance of a building". The second alternative provides a direct link to an examination or other form of assessment. So as a rule of thumb, when describing performance criteria, think about how it can be assessed or demonstrated.

Competency 1

Demonstrate sufficient knowledge of building thermal performance to undertake a thermal performance assessment.

Description: This unit specifies the competency required to apply thermal performance principles to a thermal performance assessment of a building for regulatory or other purposes.

It relates to performance criteria *3.2 Apply knowledge of thermal performance of buildings and materials to propose recommendations for improving performance* within the competency *Undertake a thermal performance assessment of a building using TPAT.*

Element	**Performance Criteria** *(what would someone need to know or do to meet this element of the competency?)*
1. Identify and describe the impacts of building thermal performance.	1.1 Explain what is meant by the term building thermal performance. 1.2 Explain the relationship between building thermal performance and heating and cooling energy consumption. 1.3 Identify the main uses of energy in buildings and the proportion attributed to heating and cooling. 1.4 Explain the meaning of terminology used to describe energy use, including: power, energy, efficiency and primary energy source 1.5 Define the units of measurement of power and energy. 1.6 Describe the cost and environmental impacts of energy use, including: resource depletion, greenhouse gas emissions and global warming.
2. Identify and describe how heat is transferred	2.1 Explain the meaning of terminology used to describe heat transfer: • conduction • radiation • convection • evaporation. 2.2 Identify and describe the ways that a building can lose and gain heat.
3. Identify the factors that influence thermal comfort	3.1 Explain the term *thermal comfort* and describe its use in building thermal performance assessments 3.2 List and describe physical factors that influence thermal comfort, include: • temperature • humidity • radiation • air movement 3.3 Establish requirements for thermal comfort based on occupant needs (include consideration of age, activity levels, clothing)

4. Establish how climatic conditions will influence thermal performance	4.1 Identify sources of information on climate 4.2 Identify and describe major Australian climatic zones 4.3 Describe how climate data can be used when carrying out a thermal performance assessment (include: temperature - maximum and minimum temperatures, diurnal temperature range - humidity, wind) 4.4 Explain the impact of local climatic conditions on building thermal performance (include: temperatures, sunshine, shading, humidity and wind) 4.5 Make recommendations for improving thermal performance that are appropriate to the climate
5. Describe the thermal performance properties of common building materials and evaluate the role of materials in building thermal performance	5.1 Identify sources of information relating to the thermal performance of building materials 5.2 Describe the properties of materials which can influence thermal performance (include: u value, r value, reflectivity, emissivity) 5.3 Describe the properties of glazing units which can influence thermal performance (include: u value, SHGC, VLT) 5.4 Explain how the use of building materials can influence the thermal performance of a building (glass, mass, insulation) 5.5 Determine how climate can influence the choice of materials when improving the thermal performance of a building 5.6 Describe the physical constraints which will influence the choice of materials (include: size, space, costs, practicality) 5.7 Select materials suitable for a given thermal performance improvement task
6. Determine the influence of building design elements on building thermal performance	6.1 Identify and describe building design elements which influence the thermal performance of a building (include: orientation, zoning/layout, insulation, mass, glazing, materials, ventilation, convection, shading, landscaping) 6.2 Explain the impact that building design elements can have on thermal performance 6.3 Describe how building design elements can be altered to improve thermal performance 6.4 Specify correct use and installation of materials (insulation, draught proofing, glazing, mass)

Range of Variables

Climate refers to the climate in the areas in which a participant will be conducting assessments.

Prerequisites: It is suggested that trainers delivering courses for this competency set the following abilities as pre-requisites:

- interpret building plans
- demonstrate basic knowledge of construction systems and materials

Duration: Depending on levels of existing skill and knowledge, a minimum duration of 8 hours has been suggested for successful completion of this competency:

Evidence Guide and Assessment Criteria

It is suggested that assessment of this competency be carried out in either a training context or as a separate exam. Assessment tasks should require candidates to demonstrate knowledge as well as to apply that knowledge with a particular emphasis on problems solving and explanation.

Recognition of Prior Learning and Experience

Prior learning and experience can be assessed and recognised by:

- allowing candidates to undertake assessment tasks prior to participating in the training course
- provision of an acceptable certificate of prior training (this should be the case for existing users of assessment tools).

Requirements for Trainers

Trainers delivering a course to meet these competencies should:

- have a training qualification (minimum Certificate IV in Assessment and Workplace Training)
- be able to demonstrate that they can meet each of the performance criteria described in this competency
- demonstrate workplace experience.

Competency 2

Undertake a thermal performance assessment of a building using a thermal performance assessment tool (TPAT).

Description: This unit specifies the competency required to undertake a thermal performance assessment of a residential building using a TPAT, whether for regulatory or other purposes. Regulatory and administrative requirements are covered in a separate competency: *Fulfil regulatory and administrative requirements when undertaking thermal performance assessments.*

Element	**Performance Criteria**
1. Extract information from plans and input into assessment tool	1.1 Use computer to navigate TPAT and manage files 1.2 Identify details on plans and specifications required for conducting the assessment 1.3 Input information from plans and specifications into TPAT 1.4 Describe methods for inputting unusual materials and designs
2. Conduct assessment and interpret output	2.1 Explain assumptions used in the TPAT when conducting an assessment (include: occupancy profiles, thermostat settings and climate data) 2.2 Use TPAT to generate outputs 2.3 Describe TPAT output: • Rating / non-rating mode • heating, cooling and latent cooling in $Mj/M^2/yr$ • temperature histograms 2.4 Identify and correct errors in data input and assessment
3. Make appropriate recommendations to improve rating	3.1 Interpret output to identify strengths and weaknesses in a building's thermal performance 3.2 Apply knowledge of the thermal performance of buildings and materials to propose recommendations for improving performance 3.3 Use TPAT to assess the impact of the recommendations on the performance 3.4 Explain the cost implications of recommendations 3.5 Explain the practical application of recommendations (how will it be built)

Range of Variables

Thermal performance assessment tool (TPAT) refers to various software applications for assessing thermal performance: AccuRate, FirstRate, BERS

Prerequisites: It is suggested that trainers delivering courses for this competency set the following abilities as pre-requisites:

- interpret building plans and specifications
- estimate the quantity and cost of building elements
- use a computer and undertake basic program operation and file management.

Duration: Depending on levels of existing skill and knowledge, the following minimum durations have been suggested for successful completion of this competency:

- for participants with no prior experience in using TPATs : 1- 2 days depending on the software
- for participants that can demonstrate competent use of previous versions of TPATs: 4 hours.

Evidence Guide and Assessment Criteria

It is suggested that assessment of this competency be carried out in either a training context or as a separate exam. Assessment tasks should require candidates to demonstrate the performance criteria listed above and it is recommended that candidates be required to carry out thermal performance assessments on several different types of buildings.

It is also important that examination tasks ensure that participants demonstrate an ability to use knowledge of thermal performance to improve a rating rather than a trial and error approach – this can be assessed by requiring participants to undertake an assessment exercise as well as to answer questions on why a particular rating changed.

Recognition of Prior Learning and Experience

Requirements for Trainers

(as per Competency 1)

Competency 3

Fulfil regulatory and administrative requirements when undertaking thermal performance assessments.

Description: This unit specifies the competency required by accredited thermal performance assessors to fulfil state/territory regulatory requirements and the administrative requirements of the accreditation body when undertaking thermal performance assessments.

Element	Performance Criteria
1. Ensure that regulatory requirements are fulfilled when undertaking building thermal performance assessments	1.1 Explain when thermal performance assessments are required for a building or building design 1.2 Explain how ratings are used and the current ratings requirements 1.3 List the information that is required to be provided to a client and/or consent authority 1.4 Explain how the information referred to above must be documented 1.5 Describe an assessor's legal responsibilities
2. Fulfil requirements of accreditation body	2.1 Describe the accreditation process in your state, include: • name of accreditation body • training, examination and auditing requirements • renewal of accreditation • listings of assessors 2.2 State the roles and responsibilities of an accredited assessor 2.3 Demonstrate an understanding of any Code of Conduct set by the accreditation body 2.4 List any administrative requirements which must be followed when undertaking or reporting on a thermal performance assessment

Range of Variables

Regulatory requirements will vary between Australian states and territories. Participants need to cover the regulatory requirements for the states or territories in which he or she plans to conduct assessments.

Prerequisites: There are no prerequisites for this competency.

Durations: The minimum duration for this competency is 2 hours.

Evidence Guide and Assessment Criteria

Recognition of Prior Learning and Experience

Requirements for Trainers

(as per Competency 1)

Attachment 2 – Summary of Survey Results

The following people were invited to answer survey questions prior to the development of the preliminary Course Framework.

ACT	Tony Trobe	TT Architecture
	Trevor Lee	Energy Partners
NSW	Matt Fisher	HMB / ABSA
	John Ballinger	RC & C Consulting
	David Seddon	Solar Smart
	Gavin Chambers	Newcastle MBA
	Max Mosher	Comfy House Design
NT	Johanna Kieboom	Northern Territory Government
Qld	Ray Jones	Environment Protection Agency
	Holger Wilrath	Solar Logic
SA	Jim Woolcock	House Energy Rating (check website for exact name)
	Mary Andruchowzcz	Planning South Australia
Tas	Hilary Schofield	Department of Infrastructure, Energy and Resources
	Wayne Gorman	Energy and Environmental Rating Association Inc
Vic	Tony Isaacs	Sustainable Energy Association Victoria
WA	Nikki Taylor	Sustainable Energy Development Office
National	Angelo Delsante	CSIRO
	Stephen Berry	Australian Greenhouse Office

Note: The following people are still to be contacted:

Joanne Warren-Wilson	ACT Planning and Land Authority
Graeme Hunt	Tasmanian Department of Infrastructure, Energy and Resources

The questions asked in the survey are listed below, along with an amalgamated summary of the responses received by 7 May 2004:

What requirements for building thermal performance assessment exist in your state?

ACT: Vendor disclosure of House Energy Rating when selling an existing home. New homes require 4 star rating

NSW: 80% of new homes currently require 3.5 star rating under local government Development Controls. New regulations being introduced (BASIX) will require approximately half of all new homes to achieve the equivalent of a 4 star rating. (The remainder will be subject to DTS requirements)

NT: None. New homes are subject to BCA DTS requirements. (Some public sector developers require 4 star rating)

Qld: 4 star rating option under BCA Verification Method.

SA: 4 star rating option under BCA Verification Method.

Tas: 4 star rating option under BCA Verification Method.

Vic: 4 star rating required by BCA (No DTS option). 5 star requirement to be phased in.

WA: 4 star rating option under BCA Verification Method.

How many assessors are practicing in your state?

ACT: 212 in 2003

NSW: 310 currently accredited, 550 accredited over 5 years, approx 2,000 trained.

NT: 3

Qld: 330 completed training

SA: 28 in 2003

Tas: 3

Vic: More than 600

WA: 150 in 2003

How many assessments are carried out each year in your state?

ACT: approximately 8,000 per annum

NSW: approximately 32,000 per annum

NT: 10 to 20 per annum

Qld: -

SA: -

Tas: 100 to 200 per annum

Vic: currently 8,000 per annum, due to increase to 40,000

WA: 1,700 in 2002 - 03

What are the current practice requirements for assessors in your state?

ACT: accreditation with ACT Planning & Land Authority – exam, annual fee, auditing

NSW: accreditation with ABSA (formerly HMB) – exam, annual fee, auditing, PI insurance

NT: no formal accreditation process – interstate assessors utilised

Qld: training by software distributor

SA: accreditation with Building Advisory Committee – exam

Tas: no formal accreditation process

Vic: accreditation with SEAV – exam, annual fees, auditing

WA: accreditation with SEDO – exam, annual fees (?), auditing

How does the public find an assessor?

ACT: ACTHERS website
NSW: HMB website
NT: no formal listing
Qld : Solar Logic website
SA : Planning SA website
Tas: Dept Infrastructure Energy and Resources has a list
Vic: SEAV website

What is the relationship between trainers and accrediting organisations?

ACT: there is one trainer under contract to ACTHERS
NSW: there is no formal relationship between trainers and ABSA. Known NatHERS trainers are listed on the website.
Qld: Training is provided by Solar Logic, the BERS developer and distributor.
Vic: Memorandum of understanding between trainers and SEAV. Trainers have to go through training and testing.
SA: Trainers licensed by SEAV (Vic).
Tas: Trainers licensed by SEAV (Vic)
WA: Memorandum of understanding between trainers and SEDO.

How do applicants find out about training?

In general, the website of the accreditation body, training organisations or software distributors provided details of training.

There are pre-requisites for training in ACT and pre-requisites are being considered in WA – no other states have pre-requisites for training.

What is the current training format?

All training was face to face rather than by correspondence, though a correspondence training package is included in current NatHERS software.

NatHERS and BERS training runs for two days. FirstRate training runs for either one or two days depending on the state.

Several people surveyed commented that there is value in having two days of training split up so that there is at least a week between day one and day two.

What is the cost for training?

Costs for training varied between $400 and $750 for a course.

What does the training cover?

The following areas are covered in current training to varying extents depending on the course:

- using the software to produce ratings
- using the software to improve a rating
- discussion of factors that lead to improving a rating
- discussion of requirements of assessors (codes of practice)

With all courses the primary focus is on hands-on use of the software to produce ratings. Some trainers include thermal performance theory, separate to software use.

What training materials are given to trainees?

This varies but tends to include a training manual containing software instructions, some theory and copies of any presentation slides.

What are the strengths and weaknesses of current training?

Strengths

- knowledgeable and experienced trainers
- hands on use of the software
- trainers often offer post-training support (contact as well as materials).

Weaknesses

- a lot of material to cover in a short time
- participants come to the courses with very varied levels of ability on a range of issues (plan reading, computer usage, understanding of buildings and thermal performance). For some people, the training is easy and very useful, whereas others may struggle.
- often difficult to translate the principles of thermal performance into an improved rating during training so some participants rely on a trial and error approach to improve ratings rather than drawing on an understanding of building thermal performance.

Do you consider that a formal examination process is required?

The majority of people surveyed felt that an examination process is essential to ensuring a base level of quality for assessors. Overall it was felt that exams should test for:

- the ability to produce ratings
- the ability to improve ratings
- the ability to explain how the ratings were improved
- an understanding of the relevant code of practice and /or regulatory requirements.

It was also pointed out that in accreditation systems where there is a strong auditing process, the examination is less important.

What is the format and content of the current exam process?

Victoria, Tasmania, SA and WA use the FirstRate exam – a take home exam requiring the assessment of two buildings as well as answering questions on the code of practice.

In NSW there is a take home exam which also requires the candidate to rate two buildings.

In ACT the examination is carried out on the last quarter of the second day of training.

What are the strengths and weaknesses of the exam process?

Some people surveyed felt that while the take home exams are practical there should at least be a component of the exam for which attendance is required, to ensure that people are actually able to do the given task themselves (whether question and answer or software based).

It was generally agreed that the exams are very good for ensuring that some level of quality is applied to assessors.

Several people surveyed felt that the exam did not adequately reflect the complexities that assessors would face when conducting assessments.

It was also noted that exam (and audit) results indicate that some assessors may be using a trial and error approach rather than using knowledge of thermal performance and building construction systems to improve ratings. Concern was raised that this can lead to impractical and/or costly suggestions and that these assessors may not be able to achieve suitable ratings as the star ratings requirements increase in the future.

Other comments

Several people surveyed commented on the importance of the trainer's skills and knowledge and the need to ensure the quality of trainers.

A number of comments indicated that people felt that the varied backgrounds and levels of interest of the training participants is the main factor influencing the quality of assessments, given the brief and software focussed nature of the training.

With this in mind, the following issues were identified as deficiencies in practicing assessors. (This list does not reflect the the profession as a whole but aims to provide an indication of areas which could be improved either through training or pre-requisite requirements).

- inability to interpret drawings / plans accurately
- inability to know what information was required to input into the software (and therefore inability to determine whether plans contain sufficient information for an assessment)
- poor understanding of construction systems resulting in impractical recommendations
- poor understanding of the cost implications of some recommendations
- poor understanding of local climatic issues and impact of climate on the use of the assessment tool
- difficulties in assessing complex buildings or unusual features and materials
- poor understanding of how heat flows through buildings and of thermal performance in general
- inattention to requirements of assessors as set out in codes of conduct or regulations, for example, failure to submit certificates and ensure ratings information is accurately recorded on drawings.