



Australian Government

CPCSUS5002A Develop action plans to retrofit existing buildings for energy efficiency

Release: 1

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Modification History

New unit.

This version first released with CPC08 Construction, Plumbing and Services Training Package Version 9.

Unit Descriptor

This unit of competency specifies the outcomes required when planning to improve the energy efficiency of an existing building.

Application of the Unit

This unit of competency applies to those involved in the design or development of retro fits for energy efficiency, including building designers, tradespeople and building project managers.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Pre-Requisites

Nil

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

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|---|---|---|
| 1 | Commence retro-fit planning processes. | 1.1 <i>Client requirements and expectations</i> for the specific use of the building and the energy efficient retro-fit priorities are discussed and incorporated into planning. |
| | | 1.2 <i>Energy assessment is</i> initiated or report from a prior assessment is reviewed and discussed with key stakeholders to determine energy conservation measures. |
| | | 1.3 <i>Client is provided with overview of recommended processes and information relevant to generating an energy efficient retro fit.</i> |
| 2 | Identify and evaluate opportunities to improve energy conservation and efficiency of the existing building. | 2.1 Recommendations from energy efficiency assessor are reviewed and evaluated for input into the retro-fit action plan. |
| | | 2.2 <i>Limitations and obstacles</i> involved in the energy efficiency upgrade of the building are identified and appropriate <i>solutions</i> developed. |
| | | 2.3 <i>Risks</i> of retrofitting existing building for improved energy efficiency are identified and managed, including possible installation of mechanical ventilation systems. |
| | | 2.4 <i>Strategies</i> that provide a measurable increase in the operational energy efficiency of the existing building are developed and costed. |
| | | 2.5 Structural adequacy of the existing building is assessed to determine appropriateness of retro-fit solutions for energy efficiency. |

- 3 Research and select energy efficient materials, products and systems.
 - 3.1 **Materials**, products and systems appropriate to the existing building are researched for energy efficiency specifications.
 - 3.2 Manufacturer representatives and literature are consulted to identify installation and operational specifications.
 - 3.3 Compliance requirements for selecting and installing materials, products and systems are understood and adhered to.
 - 3.4 Thermal and acoustic insulation of the building and quality of installation are assessed where appropriate to determine energy efficiency rating and appropriate solutions to improve insulating properties of the building.

- 4 Finalise retro-fit action plan.
 - 4.1 **Final retro-fit action plan** is developed according to organisational procedures.
 - 4.2 Projected **benefits** of undertaking each of the proposed retro fit measures are explained to client.
 - 4.3 Client sign-off is obtained and **documentation** of agreed plan is finalised.

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- learning skills to evaluate information from a variety of sources to inform advice to client on retro-fitting buildings for energy efficiency
- numeracy skills to:
 - calculate and confirm correct quantities of materials for work tasks
 - prepare costings for proposed project work
- oral communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements, and share information
 - use language and concepts appropriate to cultural differences
- reading skills to:
 - interpret documentation, including drawings and specifications
 - research and interpret manufacturer product information
- writing skills to develop recommendations and reports for clients

Required knowledge

- building science principles and their application to the retro-fitting of existing buildings for improved energy efficiency
- compliance requirements relating to construction materials and methods, including:
 - Australian standards
 - environmental and sustainability requirements, including:
 - energy efficiency
 - fire resistance, including resistance from bushfire attack
 - National Construction Code deemed-to-satisfy requirements
- energy efficiency ratings available for buildings, and their meaning
- general construction terminology
- processes for calculating material requirements
- risks of completely sealing the building envelope and ways to mitigate them
- types, characteristics, uses and limitations of materials, products and systems used when retrofitting for energy efficiency
- types, uses and limitations of previously used materials
- types, uses and limitations of renewable sources of energy
- types, location and use of relevant safety information, such as:
 - job safety analyses (JSA) and safe work method statements

- environmental and work site safety plans
- safety data sheets (SDS)

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment This unit of competency could be assessed by performing a range of tasks in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate construction workplace conditions, materials, activities, responsibilities and procedures.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person should demonstrate the ability to:

- develop an action plan to retrofit and improve the energy efficiency of either one existing residential building or one existing commercial building, providing evidence of the following:
 - engaging in a team environment working with stakeholders across multiple disciplines, such as engaging or leading an integrated project design or delivery of a project
 - research undertaken to identify appropriate products, materials and systems for use in the retro fit
 - evaluation of risks involved in the retro fit and identification of appropriate solutions to avoid risks or hazards to occupants and others
 - written action plan for the retro fit of the building which responds to identified client requirements and expectations, as well as research undertaken into energy efficiency opportunities and recommended systems, materials and products to be used in the retro fit with relevant costings and timelines
- locate, interpret and apply relevant information, standards and specifications to ensure the development of compliant action plans that meet client expectations and organisational policies and procedures
- comply with work health and safety (WHS) legislation, regulations and codes of practice applicable to workplace operations.

Context of and specific Assessment of this unit:

resources for assessment

- must be in the context of the work environment
- may be conducted in an off-site context, provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills
- must meet relevant compliance requirements.

Resource implications for assessment include:

- an induction procedure
- realistic tasks or simulated tasks covering the mandatory task requirements
- relevant specifications and work instructions
- tools and equipment appropriate to applying safe work practices
- support materials appropriate to activity
- research resources, including industry-related systems information
- safety data sheets.

Method of assessment

Assessment for this unit must verify the practical application of the required skills and knowledge, using one or more of the following methods:

- direct observation of tasks in real or simulated work conditions
- questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- review of relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

Guidance information for assessment

This unit could be assessed on its own or in combination with other units relevant to the job function, such as:

- CPPHSA4001A Assess household energy use

Reasonable adjustments for people with disabilities must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Assessment processes and techniques should, as far as is practical, take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. ***Bold italicised*** wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Client requirements and expectations may include:

- enhanced health and safety outcomes for occupants through improved air quality and selection of materials
- improved building durability
- increased return on investment through higher resale or higher rental income
- reduction in energy bills following retro fit.

Energy assessment:

- can include financial and non-financial benefits of retrofitting the building to improve energy efficiency
- can include recommendations that will improve the energy efficiency of the building
- identifies existing energy rating of a building using a variety of testing and assessment methods.

Information must include:

- energy efficient materials and installation methods
- regulations, codes and standards governing energy efficient construction.

Limitations and obstacles may include:

- budget constraints
- condition of existing building
- local council planning provisions, including land overlays and requirements relating to neighbourhood character
- orientation of the existing building
- original design and construction of existing building
- position of existing services to the building
- presence of protected vegetation adjacent to existing building
- protection of existing building under heritage listing
- proximity of other buildings or structures.

Solutions may include:

- engaging experts in heritage construction to advise on appropriate solutions for heritage listed buildings undergoing energy efficiency upgrades
- repairing parts of the existing structure before commencing energy efficiency retro fit
- repositioning services to the building
- seeking permission from relevant authorities to remove large trees that may inappropriately overshadow the building and reduce energy efficiency opportunities

- Risks** must include:
- selecting and using economical and effective energy efficient systems and materials.
 - risks associated with completely sealing the building envelope, such as:
 - air pressure differentials
 - combustion
 - moisture and mould
 - poor indoor air quality.
- Strategies** may include:
- changing light fittings to LEDs
 - installing motion sensor lighting
 - replacing insulation in ceilings, walls or floors
 - sealing building envelope to reduce unwanted air leakage
 - sealing openable windows
 - repositioning the heating system
 - installing solar photovoltaic systems
 - replacing electric hot water system with gas or solar hot water system.
- Materials** may include:
- aerated autoclaved concrete products
 - bricks and mortar
 - concrete blocks
 - insulating materials
 - plasterboard
 - reflective paints
 - slabs
 - timber
 - window frames and glass.
- Final retro-fit action plan** must address:
- client expectations
 - costings
 - material use
 - other resourcing
 - risk management
 - timelines.
- Benefits** may include:
- improved levels of comfort for the occupants
 - increased air changes per hour to improve indoor air quality
 - increased durability of the building
 - potential for improved return on investment
 - reduction in and prevention of mould
 - reduction in heating and cooling costs.
- Documentation** may include:
- applications for permits and service connections
 - copies of plans, drawings and specifications
 - environmental applications.

Unit Sector(s)

Construction

Custom Content Section

Not applicable.