



Australian Government

Department of Education, Employment and Workplace Relations

CPPHSA4001A Assess household energy use

Release: 1

CPPHSA4001A Assess household energy use

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	<p>This unit of competency specifies the outcomes required to collect and analyse information on household energy use and provide advice on ways to improve energy efficiency in the home.</p> <p>No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.</p>
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Application of the Unit

Application of the unit	<p>This unit of competency supports the work of home sustainability assessors engaged in assessing residential energy use and providing advice on ways to improve energy efficiency in the home.</p>
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and organise the assessment.	<p>1.1 <i>Need for assessing energy use</i> in a <i>residential building</i> is clarified with <i>client</i>.</p> <p>1.2 <i>Effective communication strategies</i> are employed to assist in establishing rapport with client and in responding to client questions and concerns.</p> <p>1.3 Assessment is planned in line with enterprise practice, client requirements, <i>commonwealth, state or territory, and local government legislation and regulations, and industry ethical and conduct standards</i>.</p> <p>1.4 <i>Issues</i> relating to state and territory legislation and regulations and industry ethical and conduct standards are identified and clarified with client.</p> <p>1.5 Plan is established for the assessment in line with enterprise practice and client requirements.</p> <p>1.6 Potential <i>hazards</i> are identified to ensure risks are suitably managed.</p> <p>1.7 Assessment activities are planned to ensure they do not compromise the health and safety of self and others.</p> <p>1.8 <i>Assessment documentation</i> is prepared in a manner consistent with enterprise practice.</p> <p>1.9 <i>Tools, equipment and other requirements</i> for the assessment are identified and arrangements are made to ensure their availability on day of assessment.</p> <p>1.10 Client is advised of <i>information that should be obtained prior to assessment</i> and <i>details of assessment</i> are confirmed.</p> <p>1.11 Authority to proceed is obtained from client prior to commencement and reconfirmed as appropriate during the assessment.</p>
Gather data on household energy use and costs.	<p>2.1 <i>Information</i> to be gathered on household energy use and costs is confirmed.</p> <p>2.2 <i>Information on household energy use and costs</i> is collated.</p> <p>2.3 <i>Information on household water heating system</i> is gathered from resident, and from measurements and observations made during inspection of the residence.</p> <p>2.4 <i>Information on household space heating and cooling</i> is gathered from resident, and from measurements</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>and observations made during inspection of the residence.</p> <p>2.5 Information on household lighting is gathered from resident, and from measurements and observations made during inspection of the residence.</p> <p>2.6 Information on household appliances is gathered from resident, and from measurements and observations made during inspection of the residence.</p> <p>2.7 Information on behaviour and preferences of household members that impact on energy use is gathered from resident, and from observations made during inspection of the residence.</p> <p>2.8 Information is verified for accuracy and recorded using the relevant data collection tool.</p>
Analyse data on household energy use, costs and emissions.	<p>3.1 Information is analysed to identify key characteristics of household energy use, costs and emissions.</p> <p>3.2 Government rebates and other assistance programs related to improving efficiency of household energy use are identified.</p> <p>3.3 Options for improving efficiency of energy use and reducing costs and emissions are evaluated.</p> <p>3.4 Cost of options for improving household energy efficiency is estimated in line with enterprise procedures.</p> <p>3.5 Estimated energy, emissions and cost savings generated from improving household energy efficiency are estimated in line with enterprise procedures.</p>
Assess feasibility of using residence for energy production.	<p>4.1 Sources of technical advice on using residential property for energy production are identified.</p> <p>4.2 Advantages and disadvantages of using residential property for energy production are identified.</p> <p>4.3 Energy production technologies suitable for use in residential property are identified.</p> <p>4.4 Government rebates and other assistance programs for incorporating energy production technologies in residential buildings are identified.</p> <p>4.5 Feasibility of using residence for energy production is assessed.</p> <p>4.6 Estimates of cost of installing energy production technologies are produced and associated impact on</p>

ELEMENT	PERFORMANCE CRITERIA
	household energy costs and emissions is determined in line with enterprise procedures.
Report outcomes of energy use assessment.	<p>5.1 Results and recommendations, along with supporting evidence, are collated and documented in line with enterprise and client requirements.</p> <p>5.2 Estimated cost of proposed recommendations, associated reductions in household energy costs and emissions, and improvements in household energy efficiency are calculated in line with enterprise procedures.</p> <p>5.3 Results and recommendations, including estimated costs and improvements in household energy efficiency, are explained to client in line with enterprise, legislative and client requirements.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication skills to interact with clients from diverse social, economic and cultural backgrounds
- decision-making and problem-solving skills to make recommendations based on analysis of household energy use
- literacy skills to:
 - complete standard forms
 - generate business correspondence
 - interpret gas and electricity accounts
 - prepare reports
 - read and interpret a variety of texts, including legislation, regulations, and codes of conduct and ethical standards
- numeracy and data analysis skills to:
 - extract and interpret data from gas and electricity accounts
 - interpret energy plans and tariff structures
 - read, calculate and interpret data from gas and electricity meters and the outputs of energy measuring tools
- planning, organising and scheduling skills to undertake work-related tasks, such as

REQUIRED SKILLS AND KNOWLEDGE

collecting data required for assessing household energy use

- research skills to identify and locate documents, reports and information on key matters associated with energy use, such as:
 - energy ratings of appliances
 - power consumption of appliances
 - residential greenhouse emissions
- technology skills to:
 - enter data and use the functions of energy use calculators and general purpose software packages
 - use energy measuring tools
- time-management skills to complete assessment tasks in a time and cost efficient manner

Required knowledge

- commonwealth, state or territory, and local government legislation and regulations impacting on household energy use and management related to:
 - anti-discrimination and equal employment opportunity
 - consumer protection, fair trading and trade practices
 - employment and industrial relations
 - environment protection
 - household energy and energy-production technologies
 - occupational health and safety (OHS)
 - privacy
- energy:
 - fuel switching
 - load switching
 - greenhouse coefficient
 - measuring energy
 - operational and embodied energy
 - sources of energy
 - trends in household energy use and emissions and factors impacting on those trends
 - units of measurement
- energy bills:
 - actual and estimated bills
 - cost calculations
 - plans
 - tariffs
- energy measuring tools:

REQUIRED SKILLS AND KNOWLEDGE

- types
- uses
- energy rating systems for domestic appliances:
 - compliance plates:
 - data
 - procedure for reading
 - energy labels
- energy types:
 - biomass
 - diesel
 - electricity
 - gas
 - geothermal
 - mini hydro
 - oil
 - solar energy
 - solid fuel
 - wind
- government rebates and other assistance programs related to improving energy efficiency in residential buildings
- greenhouse gas emissions:
 - relationship between energy consumption and greenhouse gas emissions
 - ways of reducing greenhouse gas emissions through improving household energy efficiency
- green power sources
- household energy use:
 - cooking
 - heating and cooling
 - internal and external appliances
 - lighting
 - refrigeration
 - water heating system
 - water pump
- impact of attitudes, behaviour and preferences of household members on energy use
- options for improving efficiency of household energy use:
 - behaviour change
 - heating and cooling

REQUIRED SKILLS AND KNOWLEDGE

- internal and external appliances
- lighting
- water heating system
- water pump
- residential energy production:
 - criteria for assessing feasibility
 - rebates and other forms of financial support
 - residential photovoltaic cells
 - sources of information
- sources of data on residential energy use and cost:
 - electricity and gas bills
 - electricity and gas meters
 - instant energy display units
- standby power

Evidence Guide

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 conducting an assessment of energy use in a residence, which involves collecting and analysing information on household energy use and providing advice on ways to improve energy efficiency.

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

A person who demonstrates competency in this unit must be able to provide evidence of the required skills and knowledge specified in this unit.

In particular, the person should demonstrate the ability to:

- collect and analyse information on household energy use and provide advice on ways to improve energy efficiency in the home
- assess feasibility of using a residential building for energy production
- meet all OHS requirements when conducting household

	<p>energy assessments</p> <ul style="list-style-type: none"> • apply knowledge of: <ul style="list-style-type: none"> • trends in household energy use and costs • major sources of household energy use • ways of gathering information on household energy use and costs • ways of improving household energy efficiency.
Context of and specific resources for assessment	<p>Assessment of essential underpinning knowledge may be conducted in an off-site context and is to comply with relevant regulatory and Australian standards' requirements.</p> <p>Resource implications for assessment include:</p> <ul style="list-style-type: none"> • data collection tools • relevant codes, standards and government regulations • access to residential buildings for conducting an assessment of energy use • technology suitable for generating reports • technical reference library with current publications on: <ul style="list-style-type: none"> • Australian climatic zones • energy rating schemes • energy use and measurement • manufacturers' product information on domestic appliances, heating and cooling, water heating and lighting products • residential energy production technologies.
Method of assessment	<p>Assessment methods must:</p> <ul style="list-style-type: none"> • satisfy the endorsed Assessment Guidelines of the CPP07 Property Services Training Package • include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application • reinforce the integration of employability skills with workplace tasks and job roles • confirm that competency is verified and able to be transferred to other circumstances and environments.
Guidance information for assessment	<p>This unit could be assessed on its own or in combination with other units relevant to the job function, for example:</p> <ul style="list-style-type: none"> • CPPHSA4002A Assess household waste generation and management • CPPHSA4003A Assess household water use

	<ul style="list-style-type: none"> • CPPHSA4004A Assess thermal performance of existing residences using non-rating tools and techniques. <p>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.</p> <p>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.</p>
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Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. 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.</p>	
<p><i>Need for assessing energy use</i> may include assessment for:</p>	<ul style="list-style-type: none"> • determining energy profile, identifying opportunities for reducing energy use and improving energy efficiency • legislative, regulatory and compliance purposes • providing building design advice.
<p><i>Residential building</i> refers to:</p>	<ul style="list-style-type: none"> • any building categorised as Class 1, 2, 4 and 10a of the Building Code of Australia or in accordance with jurisdictional requirements.
<p><i>Client</i> may include:</p>	<ul style="list-style-type: none"> • builder • community organisation • construction manager • government agency • house owner • landlord • property developer • property manager • real estate agent • tenant.
<p><i>Effective</i></p>	<ul style="list-style-type: none"> • active listening

<p>communication strategies may include:</p>	<ul style="list-style-type: none"> • being non-judgemental • exploring problems • expressing an individual perspective • providing sufficient time for questions and responses • providing summarising and reflective responses in conflict situations • using appropriate words, behaviour and posture • using clarifying, summarising questions • using clear and concise language • using culturally appropriate communication • using plain English • using verbal and non-verbal communication.
<p>Commonwealth, state or territory, and local government legislation and regulations, and industry ethical and conduct standards may include:</p>	<ul style="list-style-type: none"> • energy and energy management • energy use assessment: <ul style="list-style-type: none"> • accreditation • assessment procedures • certification • documentation • environment protection • ethical behaviour • fair trading and consumer protection: <ul style="list-style-type: none"> • confidentiality • conflict of interest • duty of care • non-discriminatory practices • privacy • residential tenancies • mandatory disclosure • OHS • retailer obligation schemes • white certificate schemes.
<p>Issues may include:</p>	<ul style="list-style-type: none"> • basis for the need to conduct energy assessment • information required by assessor from client • information that assessor is required to document • objectives of assessment.
<p>Hazards may include:</p>	<ul style="list-style-type: none"> • appliances: <ul style="list-style-type: none"> • electrocution • faulty • biological waste • confined spaces • electricity

	<ul style="list-style-type: none"> • harassment, bullying and/or violence involving co-workers or customers • hazardous substances: <ul style="list-style-type: none"> • asbestos • chemicals • fibres • fumes • insulation • heat: <ul style="list-style-type: none"> • burns • scalds • lighting: <ul style="list-style-type: none"> • bulbs • electrocution • manual handling: <ul style="list-style-type: none"> • carrying • lifting • pulling • pushing • machinery, including powered and non-powered equipment • skin penetrating injuries: <ul style="list-style-type: none"> • knives • sharps • syringes • work environment: <ul style="list-style-type: none"> • access • animals • dust • floor surfaces • lighting • noise • smoking • temperature extremes • working alone • working at heights • ventilation.
<p><i>Assessment documentation</i> may include:</p>	<ul style="list-style-type: none"> • assessor name and contact details • building details • building plans and specifications

	<ul style="list-style-type: none"> • checklists • client details • company promotional materials • existing energy bills • energy utility charges, rebates and programs for encouraging energy efficiency • photographic evidence • risk assessment • site details.
<p><i>Tools, equipment and other requirements</i> may include:</p>	<ul style="list-style-type: none"> • calculator • clipboard • compass • digital camera • energy monitoring equipment: <ul style="list-style-type: none"> • electricity meters • gas meters • power meters • incense sticks to observe air flow and draughts • infra-red thermometer • ladder • lux meter • personal protective equipment (PPE): <ul style="list-style-type: none"> • dust masks • eye protection • gloves • headwear • overalls • safety shoes and work boots • power meter • stopwatch • tape measure • thermometer • torch.
<p><i>Information that should be obtained prior to assessment</i> may include:</p>	<ul style="list-style-type: none"> • appliances: <ul style="list-style-type: none"> • age • capacity • number • type • energy accounts: <ul style="list-style-type: none"> • billing history

	<ul style="list-style-type: none"> • electricity • gas • solid fuel • household members: <ul style="list-style-type: none"> • number • age • insulation.
<i>Details of assessment</i> may include:	<ul style="list-style-type: none"> • address of residence • assessor name and contact details • cost of assessment • date and time of assessment • duration of assessment • name of householder.
<i>Information</i> may include:	<ul style="list-style-type: none"> • energy costs • energy use and behaviour and preferences of household members that impact on energy use • heating and cooling • internal and external appliances • lighting • water heating system • water pump.
<i>Information on household energy use and costs</i> may be gathered through:	<ul style="list-style-type: none"> • analysis of gas and electricity meter readings: <ul style="list-style-type: none"> • conventional meters • instant energy display units • smart meters • analysis of accounts to show current, seasonal and trend data on use and cost of: <ul style="list-style-type: none"> • electricity • gas: <ul style="list-style-type: none"> • LPG • natural • solid fuel: <ul style="list-style-type: none"> • coal • coke • diesel • oil • wood • analysis of costs of different energy plans and tariffs <ul style="list-style-type: none"> • tariffs: <ul style="list-style-type: none"> • peak • off peak

<p><i>Information on household water heating system</i> may include:</p>	<ul style="list-style-type: none"> • solar power and metering. • features of water heating system: <ul style="list-style-type: none"> • age • capacity • condition • energy use • energy rating • insulation: <ul style="list-style-type: none"> • hot and cold water pipes • tank • location • standby losses • star rating (if gas) • suitability for size of household • thermostat settings • type and number of showerheads • use of solar thermal hot water heaters • type of water heating system: <ul style="list-style-type: none"> • electric instant • electric storage • electric heat pump • gas storage • gas instant • solar.
<p><i>Information on household space heating and cooling</i> may include:</p>	<ul style="list-style-type: none"> • ceiling fans: <ul style="list-style-type: none"> • ability to reverse • age • type • placement • draughts and air leaks: <ul style="list-style-type: none"> • causes: <ul style="list-style-type: none"> • doors • exhaust fans • gaps around plumbing pipes • gaps around power points and light switches • gaps between floorboards • recessed light fittings • wall-mounted air conditioners • windows

	<ul style="list-style-type: none"> • tests: <ul style="list-style-type: none"> • blower door tests • incense • tealights • ductwork • heating and cooling zones • heating and cooling appliances: <ul style="list-style-type: none"> • age • condition • energy rating • energy use • maintenance costs of system • noise level • number • placement of external unit (for cooling appliances only) • suitability for space being heated or cooled • thermostat setting • type • insulation: <ul style="list-style-type: none"> • floor, roof and walls • rating • type • natural ventilation • outdoor living spaces: <ul style="list-style-type: none"> • fans • outdoor heaters • shade devices • sources of heating and cooling.
<p><i>Information on household lighting</i> may include:</p>	<ul style="list-style-type: none"> • lights and lamps: <ul style="list-style-type: none"> • colour • dimmers • lux levels • number • position • shadows cast by existing lights and lamps • total wattage of lighting: <ul style="list-style-type: none"> • each globe • each room • whole house

	<ul style="list-style-type: none"> • type of globes • type of light fittings • type of lighting: <ul style="list-style-type: none"> • recessed • surface mounted • venting of downlights • lighting sensors and timers: <ul style="list-style-type: none"> • movement • timed • natural lighting • solar lighting • use of lighting: <ul style="list-style-type: none"> • general lighting • required lighting • safety and security lighting • task lighting.
<p><i>Information on household appliances</i> may include:</p>	<ul style="list-style-type: none"> • types of appliances: <ul style="list-style-type: none"> • cooking appliances • entertainment equipment • information technology equipment • whitegoods: <ul style="list-style-type: none"> • clothes dryers • clothes washers • combination washer/dryers • dishwashers • freezers • microwaves • portable heaters and air conditioning units • refrigerators • other equipment: <ul style="list-style-type: none"> • fish tanks • gymnasium equipment • large electric appliances, such as stoves, ovens, rangehoods, and portable heaters and air conditioning units • medical equipment • small household electric appliances, such as electric kettles, irons and towel warmers • spas • swimming pools

	<ul style="list-style-type: none"> • waste disposal units • water beds • features of appliances: <ul style="list-style-type: none"> • age, position and number of appliances • average daily use of appliances • condition of appliances: <ul style="list-style-type: none"> • dust on coils • seals on refrigerators, freezers and ovens • energy and water saving features • energy rating, type and use • size of appliances: <ul style="list-style-type: none"> • appropriateness for size of household • kWh used • Mj used • standby energy use • maintenance of appliances • ventilation and microclimate.
<p><i>Information on behaviour and preferences of household members that impact on energy use may relate to:</i></p>	<ul style="list-style-type: none"> • levels of illumination • medical conditions of household members that may impact on: <ul style="list-style-type: none"> • hot water, heating, cooling, lighting and appliance requirements • capacity to manipulate controls • setting and programming thermostats • thermal comfort • use of appliances • use of hot water.
<p><i>Data collection tools may include:</i></p>	<ul style="list-style-type: none"> • checklists and forms • energy use calculators • graphs • questionnaires • self-assessment forms • software programs.
<p><i>Characteristics of household energy use, costs and emissions may include:</i></p>	<ul style="list-style-type: none"> • comparison of energy use and costs with similar households • components of energy use: <ul style="list-style-type: none"> • appliances • cooking • heating and cooling • lighting

	<ul style="list-style-type: none"> • water heating systems • occupant behaviour • seasonal variation in energy use and costs • total consumption and cost • trends in consumption and cost over time.
<p><i>Options for improving efficiency of energy use and reducing costs and emissions</i> may include:</p>	<ul style="list-style-type: none"> • appliances: <ul style="list-style-type: none"> • check size of appliances relative to household requirements, as appropriate • consider necessity of having multiple appliances • limit use of standby power by switching off appliances when not in use • maintain appliances • replace appliances with energy efficient ones • reset thermostats, where applicable • select correct location for appliances • ventilation • behaviour and preferences of household members that impact on energy use • heating and cooling: <ul style="list-style-type: none"> • heat distribution systems: <ul style="list-style-type: none"> • leaky or broken ducts • poorly insulated ducts • cross-flow ventilation • draught proofing • glazing • efficiency of central heating systems, for example, through clip-on air diverters • energy efficient space heating and cooling • insulation • passive cooling • setting of thermostats • use of fans • window and floor coverings • zoning of heating and cooling system and exclusion of wet areas • lighting: <ul style="list-style-type: none"> • increase solar lighting • install energy efficient systems • replace light bulbs with energy efficient bulbs • use different lighting levels for background and task lighting

	<ul style="list-style-type: none"> • use light colours in rooms for walls and furnishings • use sensors and timers • use separate switching and two-way switching • water heating system: <ul style="list-style-type: none"> • install showerheads with water efficiency and labelling standards (WELS) rating • install water saving aerators on taps and in tap flow regulators • install energy efficient water heating system • insulate hot water tanks and pipes • maintain and repair leaking taps and pipes • reset thermostat down to 60°C.
Evaluations take into account:	<ul style="list-style-type: none"> • availability of rebates and other assistance programs • behaviour and preferences of householders • cost • ownership of building • practicality • type of building.
Sources of technical advice on using residential property for energy production may include:	<ul style="list-style-type: none"> • accreditation agencies • architects • building designers • colleagues • consultants • energy use and management advisory services • government agencies • professional associations • research bodies • supervisors • suppliers of residential energy production technologies • utility companies.
Advantages and disadvantages of using residential property for energy production may include:	<ul style="list-style-type: none"> • advantages: <ul style="list-style-type: none"> • higher resale value • isolation for building owners from future energy price increases • pre-empt future legislative restrictions or penalties, which may force expensive retrofits to energy inefficient buildings • reduce requirement for energy austerity • reduce total net monthly cost of living • tariff benefits • value of building relative to similar conventional

	<p>buildings as energy costs increase over time</p> <ul style="list-style-type: none"> • disadvantages: <ul style="list-style-type: none"> • effort required to understand, apply and qualify for subsidies • initial cost • length of payback • overcapitalising on older buildings • possible declines in future renewable energy costs may lessen the value of capital invested in energy efficiency.
<p><i>Energy production technologies suitable for use in residential property</i> may include:</p>	<ul style="list-style-type: none"> • features of systems: <ul style="list-style-type: none"> • age and condition of system • appropriateness of size of system for size of household • average daily energy production • maintenance costs of system • number of panels or turbines • positioning of system: <ul style="list-style-type: none"> • microclimate • shading • wind turbulence • types of systems: <ul style="list-style-type: none"> • mini geothermal systems • mini hydro power systems • photovoltaic power systems • wind power systems.
<p>Assessment of <i>feasibility</i> is based on:</p>	<ul style="list-style-type: none"> • climate • cost • location • orientation • ownership of building • practicality • type • user behaviour and preferences.

Unit Sector(s)

Unit sector	Home sustainability assessment.
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Competency field

Competency field	
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