Australian Government

Department of Education, Employment and Workplace Relations

MSS015011A Conduct a sustainability energy audit

Release: 1

MSS015011A Conduct a sustainability energy audit

Modification History

Not applicable.

Unit Descriptor

This unit of competency covers conducting an audit for the specific resource of energy in an organisation or part or all of its value chain and to prepare recommendations for a reduction of, and more efficient use of, energy.

Application of the Unit

This unit applies inside organisations and their value chains. The unit has been developed with manufacturing operations as a focus. However, because of the range of organisations in a typical manufacturing value chain it may also be applied to other types of organisations (e.g. supplier of goods or services or a customer).

The energy audit may be conducted to assist in regulatory compliance or as part of a strategy to improve the sustainability of manufacturing operations. The emphasis in the unit is on informing decision making in regards to energy use in a value chain or site. Where complex electrical and other energy analysis skills are required appropriate units should be selected from the MEM05 Metal and Engineering Training Package.

It would typically be undertaken by a manager or technical specialist who had a major responsibility for sustainability as part of a broader work role, or sustainability may be their primary work responsibility. The manager or technical specialist may undertake this alone or as part of a team.

The technical measurement of operational performance or measurement of emissions or other environmental impact is not covered by this unit. However, there is a requirement to present and organise data. The complexity of this requirement will vary according to the type and scale of the organisation's processes. Where required, appropriate mathematics and statistics units should be selected from the MEM05 Metal and Engineering Training Package or other appropriate Training Package.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

THis unit contains employability skills

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

1 Identify all sources and uses of energy in process	1.1 Identify all sources of energy external to the site
	1.2 Identify all sources of energy within the site
	1.3 Identify all uses of energy by process unit
	1.4 Identify energy type and intensity required by each process unit
2 Calculate theoretical use of energy	2.1 Calculate theoretical net use of energy by type and intensity for each process unit
	2.2 Calculate overall energy balance for process/site
	2.3 Evaluate the need for energy consumption by process and units within the process compared to alternative processes/units
3 Measure actual use of energy	3.1 Determine actual net energy use for overall process/site
	3.2 Determine actual net energy use for each process unit
	3.3 Calculate difference between theoretical and actual energy use by unit and overall
	3.4 Identify actual energy type used by each process unit
4 Develop strategies for reducing the use of energy	4.1 Rank units by difference between theoretical and actual energy use
	4.2 Rank units by actual energy use
	4.3 Identify units using higher intensity energy than required
	4.4 Develop strategies to reduce energy consumption

	and/or use lower intensity energy
5 Prepare a recommendation for an energy use reduction strategy	5.1 Consult with key stakeholders
	5.2 Identify strategies required to meet regulatory or similar requirements
	5.3 Rank strategies by benefit/cost ratio
	5.4 Short-list preferred energy reduction strategies
	5.5 Prepare recommendation for improving energy usage

Required Skills and Knowledge

Required knowledge includes:

- nature of energy wastage:
  - efficiency
  - friction/fouling/scaling
  - temperature/pressure range of operation
- energy balancing techniques for process and process steps (sometimes known as heat balancing)
- methods of measuring actual process amount/flows
- waste reduction/energy efficiency strategies and methods along with costs, effectiveness and alternative strategies (e.g. efficient lighting, efficient window glass and efficient motors)
- cost-benefit analysis
- relevant legislation, regulation and protocols
- AS/NZS ISO 14000 Environmental Management Standards

Required skills include:

- mapping processes and energy flows
- interpreting schematics and drawings
- calculating, manipulating and interpreting numerical data, including establishing series, means, correlations and rates of change
- ranking energy consumption and waste based on energy balancing
- consulting with technical and operative staff on possible non-obvious energy wastes
- consulting and negotiating with stakeholders on implementation process for sustainability improvement
- preparing recommendations

Evidence Guide

Overview of assessment	A person who demonstrates competency in this unit must be able to conduct an energy audit, including calculation of theoretical and actual use of energy and preparation of recommendations for energy use reduction.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • defining appropriate boundaries for the sustainability energy audit • conducting energy balance analyses for a site or value chain • identifying high energy use/waste units/areas • undertaking benefit/cost ratio analyses • ensuring improvement strategies proposed reflect stakeholder needs and regulatory environment.
Context of and specific resources for assessment	• This unit of competency is to be assessed in the workplace or a simulated workplace environment. • Assessment should emphasise a workplace context and procedures found in the candidate's workplace. • This unit of competency may be assessed with other relevant units addressing sustainability at the enterprise level or other units requiring the exercise of the skills and knowledge covered by this unit. • The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
Method of assessment	• In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. • Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. • The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work-like environment.
Guidance information for assessment	

Range Statement

Energy/energy type	Energy/energy type includes: • operational heating and cooling • motive energy • lighting • waste energy
Theoretical use of energy	The amount of energy (work) required to move a mass or heat matter is a basic physics calculation. This is the theoretical use of energy. Anything used above this is waste (although in physics it may be referred to as inefficiency)
Energy intensity	Energy intensity includes: • required temperature, power and pressure, as relevant

Unit Sector(s)

Sustainability

Custom Content Section

Not applicable.