



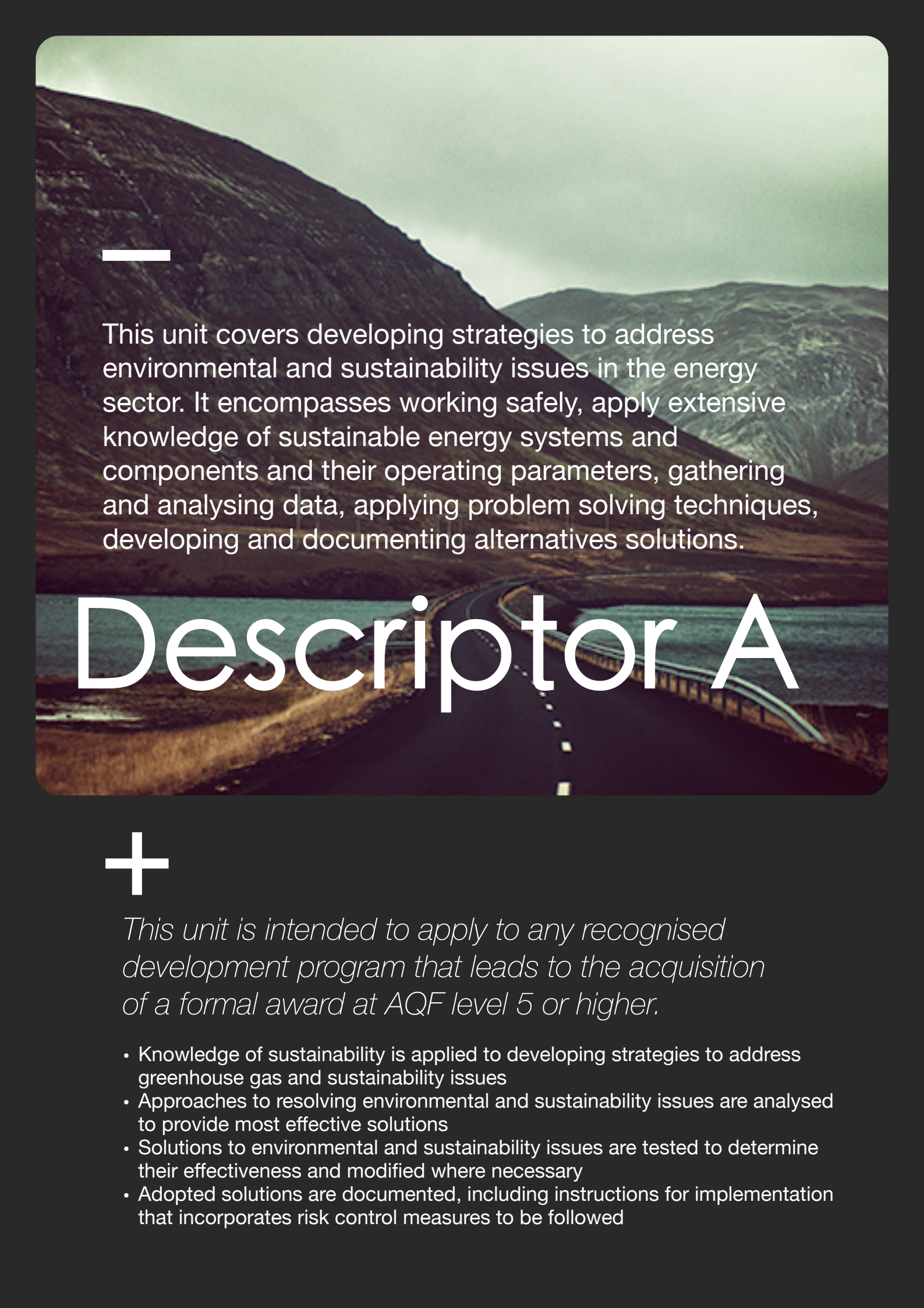
K132

Unit UEENEEK132A

Assignment Outline

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This unit covers developing strategies to address environmental and sustainability issues in the energy sector. It encompasses working safely, apply extensive knowledge of sustainable energy systems and components and their operating parameters, gathering and analysing data, applying problem solving techniques, developing and documenting alternatives solutions.

Descriptor A



This unit is intended to apply to any recognised development program that leads to the acquisition of a formal award at AQF level 5 or higher.

- Knowledge of sustainability is applied to developing strategies to address greenhouse gas and sustainability issues
- Approaches to resolving environmental and sustainability issues are analysed to provide most effective solutions
- Solutions to environmental and sustainability issues are tested to determine their effectiveness and modified where necessary
- Adopted solutions are documented, including instructions for implementation that incorporates risk control measures to be followed



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Descriptor B



This unit is intended to apply to any recognised development program that leads to the acquisition of a formal award at AQF level 5 or higher.

cont.

- Justification for strategies used to solve environmental and sustainability issues is documented for inclusion in work/project development records in accordance with professional standards

T1 Principles of sustainability encompassing:

- ways in which ecosystems moderate climate.
- ways in which ecosystems purify and store water.
- ways in which ecosystems recycle waste.

T2 Problems in a sustainable world encompassing:

- changes to Australian forest cover since white settlement, and the resulting loss of ecosystem and human benefits.
- changes to Australia's soils since white settlement, and the resulting loss of ecosystem and human benefits.
- changes to Australia's waterways since white settlement, and the resulting loss of ecosystem and human benefits.
- place of environmental accounting in quantifying Australia's environmental losses.
- limits to Australia's population carrying capacity.

T3 Sustainability principles encompassing:

- principles within sustainability including: environmental accounting and economics; full cost pricing; triple bottom line ethic; ecologically sustainable development; greenhouse gas abatement; energy efficiency; resource and water use efficiency; life cycle costing; renewable energy substitution, cleaner production; waste minimisation, reuse and recycling; ecological footprint.


T4 Addressing the problem of global warming encompassing:

- greenhouse gases and their sources and quantities that contribute to global warming.
- global warming impacts for Australia for 2030 and 2070 predicted by CSIRO modelling.
- requirements to achieve stable atmospheric concentrations of greenhouse gases.
- ecologically and economically sustainable methods for achieving these stable concentrations.

T5 Greenhouse gas emissions profile encompassing:

- goals and principles of the National Greenhouse Strategy
- what a greenhouse gas inventory is, why it is required, and the sectors to which it applies
- uses to which the National Greenhouse Gas Inventory can be applied.

T6 Understanding and communicating climate change and its impacts encompassing:
the possible impact of climate change in Australia.
techniques for improving the understanding of climate change
techniques for communicating to and educating the general public on greenhouse gas induced climate change.



T7 Partnerships for greenhouse action encompassing:


- actions achievable by each level of government to implement the NGS.
- methods by which the community activity can be engaged in the reduction of greenhouse gas emissions.
- initiatives that can be undertaken by the private sector to reduce greenhouse gas emissions.
- advantages of international partnerships.
- emissions trading system.

T8 Efficient and sustainable energy use and supply encompassing:

- techniques for reducing the greenhouse intensity of energy supply.
- types of renewable energy sources suitable for use in Australia.
- methods and technique for improving end-use efficiency.

T9 Efficient transport and sustainable urban planning encompassing:

- how integrating land use and transport planning can assist the greenhouse problem.
- how each of the following can be used to mitigate greenhouse gas; travel demand and traffic management strategies; encouraging greater use of public transport, walking and cycling; freight and logistics systems; improving vehicle fuel efficiency and fuel technologies;



T10 Greenhouse sinks and sustainable land management encompassing:

- how enhancing greenhouse sinks and encouraging sustainable forestry and vegetation management can complement the AGS.
- how greenhouse gas emissions are obtained from agricultural production and describe techniques to mitigate the emissions.

T11 Models of greenhouse best practice in industrial processes and waste management encompassing:

- types and methods of reducing greenhouse gas emissions from industry.
- methods of reducing methane emissions from waste treatment and disposal.

T12 Adaptation to climate change encompassing:

- salient points in each of the key sectors that require analysis and the strategies required in the need for adaptation to climate change



Road Ahead

*Reading, Writing &
Numeracy skills of 5,5,5
are required for this unit.*

RANGE STATEMENT

This unit must be demonstrated in relation to developing engineering strategies to address environmental and sustainability issues for at least four energy problems.

Typical sustainability issues are those encountered in meeting sustainability performance standards, such as reducing needs for energy use, reducing causes of greenhouse gas emissions, revising a energy system operating parameters and dealing with energy system efficiencies.



Road Ahead

*Reading, Writing &
Numeracy skills of 5,5,5
are required for this unit.*

CRITICAL ASPECTS OF EVIDENCE

Develop strategies to address environmental and sustainability issues as described in the topics already outlined and including:

Understanding the extent of the energy problem

Forming effective strategies for solution development and implementation

Obtaining energy system/component parameters, specifications and performance requirements appropriate to each problem

Testing solutions to energy problems

Documenting instruction for implementation of solutions that incorporate risk control measure to be followed

Documenting justification of solutions implemented in accordance with professional standards

Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

A landscape photograph showing a road in the foreground, fields in the middle ground, and a blue sky with clouds. A circular inset in the center of the image shows a reflection of the sky and clouds in a body of water. The text 'K132' is overlaid on the right side of the circular inset.

K132

Main Assignment Material Follows



ASSIGNMENT PART 1

Complete all questions: All typed neatly as a part 1 to your submission. Each answer should be of substantial content.

1. Complete an OHS assessment of your work area/environment. Note down what issues can you find, and how can these be dealt with? – (4 marks)

Please write the equivalent of 150 words for this and if possible use photographs to elaborate on your OHS assessment.

2. Draw a picture, then describe in words, the basic principles of: - (12 marks)

- a. The carbon cycle
- b. The water cycle
- c. The nitrogen cycle

3. List four major forces in our ecosystem (if these forces are unbalanced, the ecosystem will change) – (4 marks)

4. Name four indicators you could use to measure progress towards more sustainable practices at your company – (4 marks)

5. What is the current rate of change of Australia's population? What was the most significant cause of population increase in Australia in 1951? What about in 2012? – (3 marks)

6. List two different estimates of what Australia's "optimum" population might be, and describe how these estimates were calculated – (6 marks)

7. List the per-capita (per-person) energy consumption for: - (5 marks)
 - a. Australia
 - b. China
 - c. USA
 - d. Germany
 - e. Kenya

8. Discuss what sort of challenge the various per-capita energy consumption numbers in the previous question might mean for the world in 10 years' time. – (4 marks)

9. What is the thermal efficiency of a typical coal power station? What happens to the energy that is not converted to electricity? – (2 marks)

10. What are typical total losses (in %) in an Australian electricity transmission/distribution system? List 3 causes of such losses. – (4 marks)

11. There are a number of “sustainability” funding grants in Australia available to both private households and businesses at the moment. Name two of these programmes, discussing the overall benefits of this initiative, issues the end user should consider, and any potential downsides – (6 marks)



ASSIGNMENT PART 2

Introduction

This project is based on the completion of a basic “sustainability plan” for your workplace. This plan should examine the sustainability impacts of your work, and how these can be improved. If you are not currently working, then choose a workplace you are familiar with- perhaps that of a friend or family, or a previous job.

Note: In each case, refer to the topics, performance criteria and range statements shown earlier in this assignment outline. All typed neatly as a part 2 to your submission.

Content

You should investigate and report on:

What “impacts” your workplace has on the environment and community

How these impacts can be measured

How any negative impacts can be reduced, to improve the sustainability of your workplace

How you could put these improvements in place

Reasons why you adopted each idea and how you plan to achieve the outcomes.

Deliverables (what you have to give your teacher)

Investigate the above issues, and complete a 4-page report that includes the following sections:

Introduction. Introduce to your workplace (what sort of work happens there)

- Major sustainability issues. List what sorts of impacts your work has, and how could you measure sustainability in your workplace?
- Sustainability improvements. What things can you do to improve the sustainability in your workplace?
- Actions. What actions could you take to start to introduce the sustainability improvements you listed?

The report should be written in a professional manner. Include charts and photographs / illustrations.

Marking rubric-

Sustainability metrics content- up to 6 marks for correctly listing a range of measureable sustainability metrics

Improvements content- up to 4 marks for cogent discussion on how to improve the sustainability metrics listed

Actions content- up to 3 marks for cogent discussion on how to improve the sustainability metrics listed

Quality of report- up to 2 marks for quality of report- typesetting, clear and concise descriptions, correct grammar and spelling, etc.



ASSIGNMENT PART 3

This is a knowledge and skills section with short 1 paragraph answers. All typed neatly on a part 3 attachment to your submission.

1. Explain what is meant by the term “triple bottom line reporting”.
(3 Marks)

2. Name two common greenhouse gases. (2 Marks)

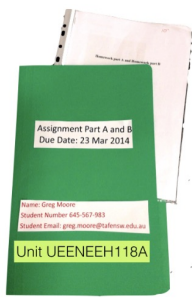
3. Describe the greenhouse effect. Draw a picture if that helps (3 Marks)

4. What is Australia's current greenhouse gas reduction target? (1 Marks)
5. Name three typical forces on the ecosystem (3 Marks)
6. Name two types of carbon pricing, and describe how each works (6 Marks)
7. Describe the basic operation of the carbon capture and storage process in electricity generation systems. Draw a picture if that helps (6 Marks)
8. What is a carbon sink? Give an example of a common carbon sink (2 Marks)
9. There is some controversy about the use of carbon sinks as a way to reduce carbon pollution. Why are carbon sinks controversial? (2 Marks)
10. Describe how encouraging greater use of public transport, walking and cycling can be used to mitigate greenhouse gas. (3 Marks)
11. Describe how encouraging greater use of freight and logistics systems / improving vehicle fuel efficiency and fuel technologies can be used to mitigate greenhouse gas. (3 marks)
12. Describe what the National Greenhouse Gas Inventory is. (2Marks)
13. Explain briefly how the emissions trading system works. (2 Marks)
14. Describe what is life-cycle costing, the principles of an ecological footprint, and cleaner production. (3 Marks)
15. Name two ways in which ecosystems recycle waste. (2 Marks)

ASSIGNMENT REQUIREMENTS !

These pages show you the minimum acceptable standard for all assignments. Assignments are to be handed in. No email assignments accepted except by prior discussion and agreement from your teacher.

Assignment Requirements



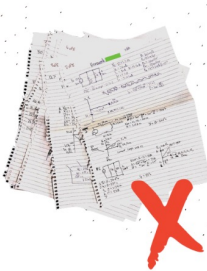
Must have name and other details as shown printed on a cover Sheet And the Unit name Also

Assignments to be handed to your teacher or another section teacher by the due date.



Good assignment example above

Assignment Requirements



This is an example of an unacceptable assignment.

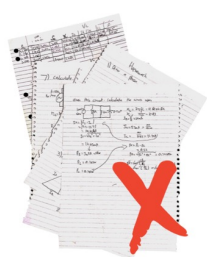
This assignment will be rejected as not acceptable.

Assignments to be handed to your teacher or another section teacher by the due date.



Bad assignment example above

Assignment Requirements



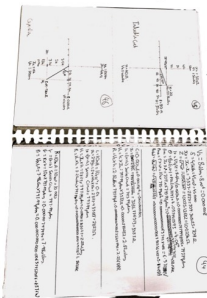
This is an example of an unacceptable assignment.

This assignment will be rejected as not acceptable.

Assignments to be handed to your teacher or another section teacher by the due date.



Assignment Requirements



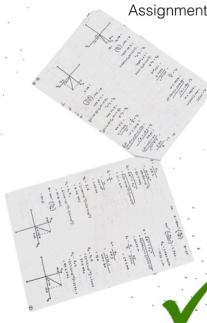
This is an example of an acceptable assignment.

This assignment will be accepted as it is neat and has all the details required.

Assignments to be handed to your teacher or another section teacher by the due date.



Assignment Requirements



This is an example of an acceptable assignment.

This assignment will be accepted as it is neat and has all the details required.

Assignments to be handed to your teacher or another section teacher by the due date.



Edit

No Email assignments.

Assignment requirements shown adjacent.

In folder, with your name and student number.

Typed and neat.

Work deemed to be of poor quality will be handed back and assessed as not competent.

This assignment has a 100% weighting in unit UEENEEK132A

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