

Electricity from Coal, Gas and Nuclear. What is the Future?

Presented by Brian Sowerby, This course is FREE with Online Subscription



Tackle the issue of electricity generation from coal, gas & nuclear with a balanced overview of options to provide electricity in the future, minimising environmental d...

Format: Short Online

Audience: High school teachers of science and geography with an interest in energy generation in the 21st century.

Description

This new course will focus on just future electricity production from non-renewable resources rather than the wider subject of energy production and use. It is based closely on a section of the current 5 hr Online course 'Sustainable Energy: An Unbiased Review of Options'.

The purpose of the course is to equip high school science and geography teachers to tackle the issue of electricity generation from coal, gas and nuclear by providing a balanced overview of the various options required to provide electricity in the future while minimising environmental damage.

The focus of the course is on providing technical details on the various technologies to provide electricity in the future and on conducting a realistic evaluation of these technologies.

The course has close links with the Australian Curriculum, namely:

- o Unit 3: "Living on Earth - extracting, using and managing Earth resources" of the Senior Secondary Science/Earth and Environmental Science syllabus
- o Unit 1: "Thermal, nuclear and electrical physics" of the Senior Secondary Science/Physics syllabus
- o Unit 4 "The changing Earth - the cause and impact of Earth hazards" (Earth and Environmental Science)
- o Year 7 Science on renewables (ACSSU116)
- o Year 8 Science on science and technology finding solutions to contemporary issues (ACSHE135)

- o Year 8 Science/Gifted and Talented Students on "Meeting Future Energy Needs"
- o Year 6 Science: Energy from a variety of sources can be used to generate electricity (ACSSU219)
- o A number of general Geography units.

Additional notes about this format

Detailed look at Sections on Electricity from longer online course "Sustainable Energy: An Unbiased Review of Options". Check out the detail below in the session outlines.

Getting Online

Please note that this is an Online learning format and we use the platform [Open Learning](#). You have a set time-frame to complete the course and can so at your own pace within the start and end dates (advertised - select 'See More' in the 'Occurrence' section below). There are no set times where you have to attend any webinars etc, everything you need will be within the Open Learning Platform. If you have any problems navigating Open Learning please contact either admin@tta.edu.au or [your Presenter](#) and we will do all we can we can to assist you.

Occurrences

There are no occurrences of this format in Australia (ACT) at this time.

Sessions

Introduction

30 minutes

Discuss motivations for changing our energy production and use (resource depletion, energy security, global warming); define terms; put Australia's energy consumption and greenhouse gas emissions in perspective; review coal, gas and uranium ore reserves; introduce a new methodology in which we use a single set of personal units everyone can relate to; view videos by Bill Gates on "Energy - Innovating to Zero" and David MacKay "How Many Light Bulbs".

Electricity Generation using Coal and Gas

20 minutes

Coal is currently an important part of the Australian economy. Coal is our second largest export commodity and coal provides about 85% of Australia's electricity production. In the present course we review current and future coal technologies. Gas is becoming increasingly important fuel and its future in electricity generation will be assessed

Carbon Capture and Sequestration

20 minutes

In this session we will attempt to determine whether coal or gas with carbon capture and storage is a viable option to meet our future energy demands.

Nuclear Power

30 minutes

Nuclear has the potential to solve our energy needs with low CO₂ emissions. Current and future nuclear technologies will be discussed as well as waste disposal, weapons proliferation, safety and cost. However, after Chernobyl and Fukushima, nuclear has a serious problem with regaining public trust.

Conclusions and Resources for Teachers

20 minutes

Briefly consider possible energy plans for the future (up to 2050). Provide copies of slides from the present course and review some resources (videos, online tools, relevant games, etc) that are available for use in the classroom. (20 min)

Note that at the end of some sessions above, a number of questions will be posed for forum discussion.

About the team



Brian Sowerby

Creator

Brian Sowerby recently retired as Chief Research Scientist and Program Manager (Instrumentation and Control) with CSIRO Minerals. He obtained a BSc (Hons 1) from the University of NSW and a PhD in physics from the Australian National University. Following two years post-doctoral work in Canada, Brian has carried out research and development in Australia on the application of on-line analysis techniques in the mineral, energy and security industries. His work led to the commercialisation of a number of on-line analysis instruments and he has received many awards for this work including the prestigious Australia Prize in 1992.



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