

Renewable Electricity? What are the options?

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



Tackle the issue of renewable electricity generation by exploring a balanced overview of options required to provide electricity in the future, minimising environmental...

Format: Short Online

Audience: High school science and geography teachers.

Description

Purpose: To equip high school science and geography teachers to tackle the issue of renewable electricity generation by providing a balanced overview of the various options required to provide electricity in the future while minimising environmental damage.

Focus of Course: Providing technical details on the various renewable technologies to provide electricity in the future and on conducting a realistic evaluation of these technologies.

Type of Course: Short (2 hour) online course

Content: Based on a section of the current 5 hr Online course 'Sustainable Energy: An Unbiased Review of Options'.

Participants would be provided with a wide range of educational resources for use in the classroom on renewable energy, including PowerPoint slides, videos, reports.

The course has close links with the Australian Curriculum:

- 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

Based closely on from the current 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

25 minutes

Discuss motivations for changing our energy production and use; define terms; put Australia's energy consumption and greenhouse gas emissions in perspective; 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".

Wind Energy

25 minutes

Wind energy is currently the cheapest source of large-scale renewable energy. The physics of wind turbines will be reviewed. Wind energy will be determined as a function of land area, wind speed, turbine diameter, wind fluctuations, etc. Renewables are diffuse (that is, they deliver only a small quantity of power per unit area of land), so if we want renewable facilities to supply power on a scale at all comparable to our consumption, those facilities must be very big. Australia's current wind farms will be discussed.

Solar Energy and Battery Storage

30 minutes

The application of solar thermal will be reviewed for both hot water and for electricity generation. The physics, development and application of solar photovoltaics to electricity generation will be discussed, both for rooftop applications and solar farms. Improvements in battery technology and lower costs will likely transform the residential electricity landscape over the next 30 years.

Hydro, Biomass Combustion, Geothermal, Wave and Tide

20 minutes

The current status and future potential of each of the above energy sources will be discussed in turn.

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.

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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Product: Renewable Electricity? What are the options?

Occurrence Date:

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