

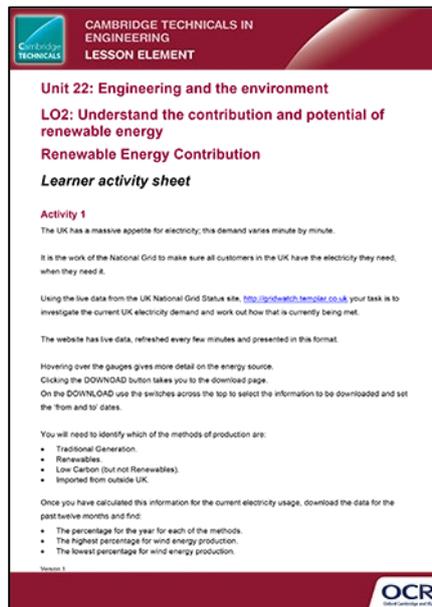
Unit 22: Engineering and the environment

LO2: Understand the contribution and potential of renewable energy

Renewable Energy Contribution

Instructions and answers for teachers

These instructions should accompany the OCR resource 'Renewable Energy Contribution' activity which supports Cambridge Technicals in Engineering Level 3.



**CAMBRIDGE TECHNICALS IN
ENGINEERING
LESSON ELEMENT**

Unit 22: Engineering and the environment

LO2: Understand the contribution and potential of renewable energy

Renewable Energy Contribution

Learner activity sheet

Activity 1

The UK has a massive appetite for electricity; this demand varies minute by minute.

It is the work of the National Grid to make sure all customers in the UK have the electricity they need, when they need it.

Using the live data from the UK National Grid Status site, <http://gridwatch.termpaper.co.uk>, your task is to investigate the current UK electricity demand and work out how that is currently being met.

The website has live data, refreshed every few minutes and presented in this format:

Hovering over the gauges gives more detail on the energy source.
Clicking the DOWNLOAD button takes you to the download page.
On the DOWNLOAD use the switches across the top to select the information to be downloaded and set the 'from and to' dates.

You will need to identify which of the methods of production are:

- Traditional Generation.
- Renewables.
- Low Carbon (but not Renewables).
- Imported from outside UK.

Once you have calculated this information for the current electricity usage, download the data for the past twelve months and find:

- The percentage for the year for each of the methods.
- The highest percentage for wind energy production.
- The lowest percentage for wind energy production.

Version 1

OCR
Oxford Cambridge and RSA

The Activity:

In this Lesson Element, learners will investigate renewable energy contribution.



This activity offers an opportunity for English skills development.



This activity offers an opportunity for maths skills development.

Suggested timings:

Activity 1: 1 hour

Activity 2: 2 hours

Activity 1

In this activity, learners will research the current UK electricity usage and how it is met over a number of months.

Learners access the live National Grid data on the Gridwatch site <http://gridwatch.templar.co.uk> and can download historic data to help answer the set questions.

Because the data is live there are no static correct answers.

Learners should realise:

- Nuclear energy is 'Low Carbon' but not 'Renewable'.
- Pumped storage is 'Renewable' as it uses energy that would be wasted to replenish hydro power reservoirs.
- ICT stands for Interconnector and is the exchange of power between nations.
- Biomass is a form of renewable energy.
- The figures do not add up exactly due to rounding and the small amount of small-scale energy production from homes and commercial sites.
- Hovering over the dials with the mouse reveals details about each energy source.

Learners are able to select the data they want to collect and the time frame. Results are presented as .CSV files which can be opened and manipulated in a spreadsheet programme such as Excel.

Activity 2

Learners will use the information gained in Activity 1 to compare current plans for renewable energy deployment with energy demands. They will then draw conclusions as to the potential of renewable energy to meet the electricity demand.

Learners are given a copy of the DECC 2050 electricity generation graph, showing the expected generation sources between 2012 and 2030.

(The Energy Security Report can be downloaded from:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65643/7101-energy-security-strategy.pdf)

How close are the figures for the previous year compared with the prediction made in 2012?

Learners should be asked to decide if the information suggests that the UK is on target against the 2030 plan.

If learners decide it is not, they should then suggest a course of action.

Learners complete the task by writing a 200-word paragraph explaining the relative importance of renewable energy in the UK energy mix.

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