



Teachers notes

Smart resources

Background information

Resources are likened to natural capital—a source of wealth used to support life. They provide not only the needs required by humans, but just as importantly, for all other animals and plants on the earth. Fossil fuels and nuclear energy are finite and are examples of non-renewable resources. Air, water, forests, fisheries and products of agriculture are examples of renewable resources. These living products of the world require no human effort to be brought back to the original state after having been used. They continue to exist and reappear due to the processes of natural nutrients cycling through the environment.

Renewable resources still have the potential to be damaged or even destroyed. Species extinction results in the loss of a renewable resource. Scientists have developed and are currently exploring many alternatives to non-renewable resources, particularly in the area of renewable energy. But without the proper management of resources (i.e. allowing the loss of biodiversity), ecosystems can lose balance and are unable to maintain their quality.

This has serious ramifications for society and, unfortunately, detrimental effects have already resulted from the loss of natural capital we have recently experienced during the industrial revolution. A shift to clean renewable energy is an example of how to correctly manage natural resources to ensure the ongoing health of the planet and, in turn, its viability for future generations.

Discussion points

- What is meant by 'by-product'?
- Why do you think renewable energy sources were not used in the first place?
- What problems may be encountered in changing from non-renewable to renewable energy sources?

Websites

www.populationinstitute.org/

www.lead.org/leadnet/footprint/intro.htm
(ecological footprint calculator)

Indicator

- Reads and understands informational text about renewable and non-renewable resources.

Outcome links

| National | NSW | Vic. | WA | Qld | SA |
|-------------------------------------|---------------------|--------------------------------------------------|------------------------------------|-----|---------------------------|
| 3.5, 3.6, 3.7, 3.8a, 4.5, 4.7, 4.8a | RS3.5, RS3.6, RS3.8 | ENRE0301, ENRE0302, ENRE0304, ENRE0307, ENRE0308 | R3.1, R3.3, R3.4, R4.1, R4.3, R4.4 | * | 3.1, 3.3, 3.7, 3.11, 3.12 |



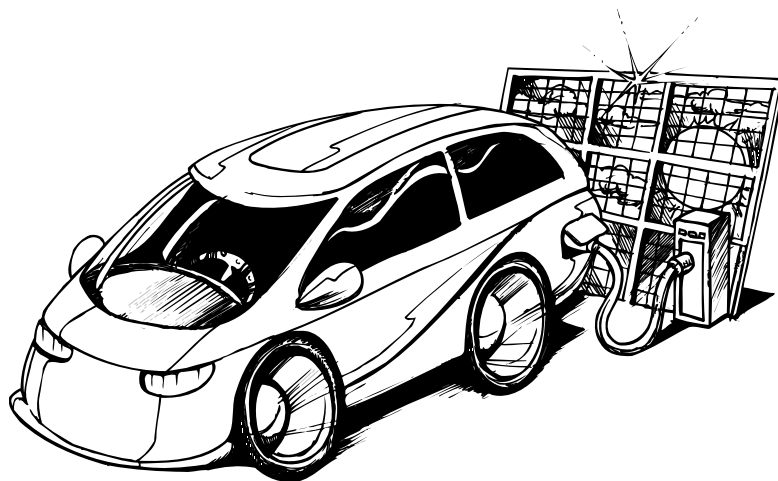
Smart resources

A resource is defined as anything obtained from the living or non-living environment to meet human needs and wants. Some resources run out—like coal which is mined from beneath the earth and used to make electricity. These resources are called non-renewable resources. Others, like fish caught from the oceans and eaten for food, should never run out because they keep reproducing. These are called renewable resources and they are definitely the 'smart alternative'. 'Smart' because, if carefully managed, these resources can be sustained forever.

We have to start thinking about alternatives for those non-renewable resources which we are currently taking from our environment before they run out. For example, coal is burned to make electricity. But once it is burned it is gone forever as a resource, while producing a lot of pollution as a by-product. One day all the coal in the world will be gone. So scientists have discovered other ways to make electricity, including:

- wind power
- solar power
- moving water power
- geothermal power (heat from below the earth's surface).

These are all renewable resources because they do not run out—they are smart alternatives to using resources that will run out. Plus there are no nasty pollution by-products like there are in burning coal. So the more we use these alternative 'smart' electricity sources and the sooner we stop using resources like coal, the better.





Answers

1. (a) and (c)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| M | E | C | R | U | O | S | E | R | V | A | N |
| A | Y | T | U | E | Y | O | F | E | V | O | G |
| L | T | C | T | X | S | L | E | P | N | B | E |
| T | I | U | O | E | P | A | I | R | L | T | L |
| E | C | D | S | D | R | R | E | O | A | A | B |
| R | I | O | U | N | R | N | R | D | M | I | A |
| N | R | R | S | E | S | Q | U | R | N | W | |
| A | T | P | T | W | T | V | U | C | E | E | E |
| T | C | Y | A | D | A | T | E | I | H | D | N |
| I | E | B | I | W | W | A | Z | N | T | R | E |
| V | L | A | N | K | E | P | N | G | O | H | R |
| E | E | N | V | I | R | O | N | M | E | N | T |
| C | I | N | O | U | O | S | J | M | G | O | B |

(b) (i) Resource—means of supplying what is needed, stock that can be drawn on.

(ii) Alternative—one of two or more possibilities

(iii) Sustain—keep going continually

(c) (i) wind (ii) solar (iii) water

(iv) geothermal

2. (a) A resource is anything obtained from the living or non-living environment to meet human needs and wants.

(b) (i) Non-renewable resources

(ii) Renewable resources

(c) A by-product is any unwanted element produced in the processes of making a product.

(d) Alternative electricity sources are 'smart' because they will not run out and they do not produce pollutant by-products.

Indicators

- Identifies and understands the meaning of new words.
- Extracts relevant information about renewable and non-renewable resources.

Outcome Links

| National | NSW | Vic. | WA | Qld | SA |
|-------------------------------------|---------------------|----------------------------------------------------------------------|------------------------------------|-----|---------------------------|
| 3.5, 3.6, 3.7, 3.8a, 4.5, 4.7, 4.8a | RS3.5, RS3.6, RS3.8 | ENRE0301, ENRE0302, ENRE0304, ENRE0305, ENRE0306, ENRE0307, ENRE0308 | R3.1, R3.3, R3.4, R4.1, R4.3, R4.4 | * | 3.1, 3.3, 3.7, 3.11, 3.12 |

* Refer to curriculum documents on <http://www.qscc.qld.edu.au>

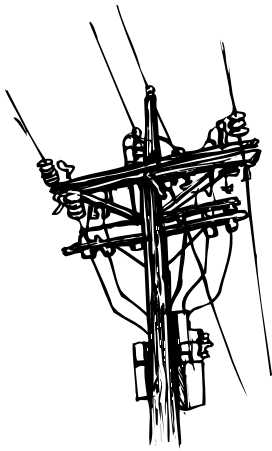


1. Complete these activities.

(a) Find each new word in the puzzle.

New words

- | | |
|--------------------|----------------------|
| <i>resource</i> | <i>obtained</i> |
| <i>environment</i> | <i>non-renewable</i> |
| <i>renewable</i> | <i>reproducing</i> |
| <i>alternative</i> | <i>sustain</i> |
| <i>by-product</i> | <i>electricity</i> |



(b) Write meanings for these words. Use a dictionary to help you.

- (i) resource _____

- (ii) alternative _____

- (iii) sustain _____

(c) There are four extra words hidden in the puzzle which are renewable electricity sources. Can you find them?

- | |
|---------------------------|
| (i) w_____ power |
| (ii) s_____ power |
| (iii) moving w_____ power |
| (iv) g_____ power |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| M | E | C | R | U | O | S | E | R | V | A | N |
| A | Y | T | U | E | Y | O | F | E | V | O | G |
| L | T | C | T | X | S | L | E | P | N | B | E |
| T | I | U | O | E | P | A | I | R | L | T | L |
| E | C | D | S | D | R | R | E | O | A | A | B |
| R | I | O | U | N | R | N | R | D | M | I | A |
| N | R | R | S | I | E | S | Q | U | R | N | W |
| A | T | P | T | W | T | V | U | C | E | E | E |
| T | C | Y | A | D | A | T | E | I | H | D | N |
| I | E | B | I | W | W | A | Z | N | T | R | E |
| V | L | A | N | K | E | P | N | G | O | H | R |
| E | E | N | V | I | R | O | N | M | E | N | T |
| C | I | N | O | U | O | S | J | M | G | O | B |

2. Answer these questions.

(a) What is a resource?

(b) (i) What are the resources that run out called?

(ii) What are the resources that do not run out called?

(c) Describe what you think is meant by the term 'by-product'.

(d) Why are the alternative electricity sources 'smart'?
