

# Types of Renewable Energy

Understanding of how different types of renewable energy work and create power.

Track with me

**Renewable Energy** - A form of energy which doesn't run out. Some examples include solar, wind and wave power, none of these are used up as they produce power. These forms of energy are expensive to purchase initially but produce power for long periods.



**Non-Renewable Energy** - These energy sources use up the planets' resources. They produce power cheaply but create lots of pollution. Perth's electricity is produced mainly by coal and gas power plants. Coal is likely to run out in the next 100 years and oil and gas will likely run out in the next 50 years.



Repeat the opposite word/phrase.

# Renewable

Doesn't run out

Repeat the opposite word/phrase.

# Non-Renewable

Does run out

Repeat the opposite word/phrase.

Solar

Sun

Repeat the opposite word/phrase.

# Fossil Fuels

Oil, Coal and Gas

# Types of Renewable Energy

Understanding of several types of renewable energy

Understanding where the energy for each comes from

## DECLARE THE OBJECTIVE

Read the learning objective to your partner.

# Types of Renewable Energy

## CONCEPT DEVELOPMENT

Pronounce with me

**Renewable**

**Re - New - Able**

Pronounce with me

**Non-Renewable**

**Non - Re - New - Able**



### DEFINITION

Energy - ability to do work, such as turning on lights or operating appliances



# Types of Renewable Energy

ACTIVATE PRIOR KNOWLEDGE

Track with me

**Renewable Energy** - A form of energy which doesn't run out. Some examples include solar, wind and wave power, none of these are used up as they produce power. These forms of energy are expensive to purchase initially but produce power for long periods.

**Non-Renewable Energy** - These energy sources use up the planets' resources. They produce power cheaply but create lots of pollution. Perth's electricity is produced mainly by coal and gas power plants. Coal is likely to run out in the next 100 years and oil and gas will likely run out in the next 50 years.



# Types of Renewable Energy

## CONCEPT DEVELOPMENT

### **Read with me**

Renewable - Something which doesn't run out

### **Track with me**

Renewable sources of energy are those which will not run out. These are much better for our planet as they normally produce power for a long time.

Generally renewable energy is expensive to set up but then cheap to produce power after that.

### **Read with me**

Non-Renewable - Something which does run out

### **Track with me**

Non-renewable sources of energy are those which will run out. These are much worse for our planet as they produce a lot of pollution.



### DEFINITION

Energy - ability to do work, such as turning on lights or operating appliances

# Types of Renewable Energy

## CONCEPT DEVELOPMENT

### Solar Power

- The energy comes from the sun.
- The solar cells convert the sun's power directly into electricity.
- They require a large area for how much power they generate but a normal house can power itself with solar panels on the roof.
- The initial cost is relatively high but will pay for itself in 5-10 years but solar panels produce power for around 20 years.
- They only produce power during the day.
- They produce more power in Summer than Winter



### Pair-share

Would solar panels be more useful in sunny Australia or not sunny Siberia? Why?

#### DEFINITION

Energy - ability to do work, such as turning on lights or operating appliances

# Types of Renewable Energy

## Solar Power

<https://youtu.be/av24fEMhDoU>

CONCEPT DEVELOPMENT



### DEFINITION

Energy - ability to do work, such as turning on lights or operating appliances

# Types of Renewable Energy

## Wind Power

- The energy comes from the sun (due to weather).
- The wind spins a turbine which generates electricity
- They do not take up much land but to make reliable power they need to be very tall.
- The initial cost is relatively high but will pay for itself in a few years but wind turbines produce power for around 20 years.
- They only produce power when there is wind but can produce power day and night.
- Most often used in coastal areas



## Pair-share

Would wind turbines be more useful in Fremantle or Kalgoorlie?

### DEFINITION

Energy - ability to do work, such as turning on lights or operating appliances



# Types of Renewable Energy

## Wind

<https://youtu.be/uBqohRu2RRk?list=PL8rTuFCJuUyhchV>

CONCEPT DEVELOPMENT



### DEFINITION

Energy - ability to do work, such as turning on lights or operating appliances

# Types of Renewable Energy

## CONCEPT DEVELOPMENT

### Hydroelectric Power

- The energy comes from water stored in a dam.
- The water spins a turbine which generates enormous amounts of electricity
- The landscape needs to suit having a dam and is changed massively by its creation as a river is blocked and big areas around can be flooded.
- The initial cost is very high but hydropower dams produce huge power for a long time.
- They produce power by releasing water through the dam, as long there is enough water you can produce as much power as needed.

### Pair-share

Would the Swan River in Perth be a suitable location for a Hydropower dam?



<https://youtu.be/pTKNT7Do3xM>

### DEFINITION

Energy - ability to do work, such as turning on lights or operating appliances

# Types of Renewable Energy

1. Which of the renewable energy sources are used most often in Australia that you have seen?
2. Why is Australia a suitable place for solar panels?
3. Where does the energy for solar and wind power come from?
4. Why are hydropower dams not used in every city?
5. Is there an advantage to using solar panels which create power only during the day versus wind turbines which make power at night?

## DEFINITION

Energy - ability to do work, such as turning on lights or operating appliances



# Types of Renewable Energy

## Track with me

Creating energy for the Earth's expanding population is getting more difficult. As fossil fuels get harder to find and run out, they become less useful for energy production.

Renewable energy is the only solution but it requires lots of money to set up. All renewable sources have down sides which make them difficult to install or maintain. As the technology gets better, costs will come down and outputs will increase but currently non-renewable sources are cheaper.

RELEVANCE

### DEFINITION

Energy - ability to do work, such as turning on lights or operating appliances

# Types of Renewable Energy

## Solar Power

Solar panels collect sunlight which is converted directly to electricity. These produce power for around 20 years but they only work during the day and need a lot of sunlight and a lot of space.

## Wind Power

Wind turbines spin with the wind and produce electricity. These require constant wind to produce useful power but will operate for around 20 years.

## Hydroelectric Power

Water held in a dam is used to move a turbine to produce electricity. They require the right landscape but create huge power.

### DEFINITION

Energy - ability to do work, such as turning on lights or operating appliances

## Types of Renewable Energy

### Be Ready to Share Your Answers

1. Using your iPad, research which countries have a large amount of their power generated by solar panels and why they use them.
2. Using your iPad, research which countries have a large amount of their power generated by wind turbines and why they use them.
3. Using your iPad, research which countries have a large amount of their power generated by hydroelectric dams and why they use them.
4. Are all three used in Australia? Where and why?
5. If you were the new Australian Prime Minister, which renewable energy source would you use most throughout Australia to generate electricity and why?

#### DEFINITION

Energy - ability to do work, such as turning on lights or operating appliances

# Types of Renewable Energy

Understanding of several types of renewable energy

Understanding where the energy for each comes from

**CHECK FOR  
UNDERSTANDING**

Check Success Criteria.