



NATURAL SCIENCES: NATS4

LESSON 15

NOTES AND ACTIVITY – US 7509

THEME: Energy and Change

TOPIC: Power Stations

At the end of this unit, you should be able to:

1. Define what a power station is.
2. Identify and distinguish between various forms of power stations.
3. Classify natural source of electricity as either renewable or non-renewable.
4. Discuss power stations advantages and disadvantages.

WHAT IS A POWER STATION?

A **power station** (power plant) is an industrial facility for the generation of electric power. Power stations are generally connected to an electric grid. An **electric grid** is an interconnected network for delivering electricity from producers (i.e. power stations) to consumers (homes and businesses).

SOME OF POWER STATIONS IN SOUTH AFRICA

South Africa generates its electricity from various power stations. The table shows only a few from the many.

A. Coal burning Power Station.



Source: Coal	Coal is a <i>non-renewable resource</i>
Most of these power stations are in Mpumalanga Province, South Africa	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Most power stations are close to coal mines • They are comparatively safe • Coal is cheaper to mine 	<ul style="list-style-type: none"> • Coal is limited • Produced smoke pollutes the air • Carbon dioxide produced contributes to global warming • Sulphur dioxide produced contributes to acid rain

B. Nuclear Power Station



Source: Uranium	Uranium is a <i>renewable resource</i>
The power station is located in Western Cape Province, South Africa	
Advantages	Disadvantages
<ul style="list-style-type: none"> • It doesn't pollute the air • Uranium is renewable • Their fuel, uranium, will not run out until fossil fuel runs out 	<ul style="list-style-type: none"> • Expensive to produce • Produced radioactive waste poses danger to living things • Radioactive waste not easy to store safely • Nuclear reactor can run out of control and release huge amounts of radiation into the air.

C. Hydroelectric Power Station



Source: Water	Water is a <i>renewable resource</i>
Most power stations are located in Free State Province, South Africa	
Advantages	Disadvantages
<ul style="list-style-type: none"> • It doesn't pollute the air • Water is renewable • Cheaper to produce as water is a natural resource • Their built next to dams, no transport needed for water 	<ul style="list-style-type: none"> • Dam flooding may displace communities • Not sustainable during drought seasons

D. Wind Power Station



Source: Wind	Wind is a <i>renewable resource</i>
Most power stations are located in Western Cape Province, South Africa	
Advantages	Disadvantages
<ul style="list-style-type: none"> • It doesn't pollute the air • Wind is renewable • Cheaper to produce as water is a natural resource 	<ul style="list-style-type: none"> • Wind farms uses a lot of land • Wind farms must have ways to store electricity in case there's not enough wind, e.g. in winter

	<ul style="list-style-type: none"> • Wind turbines are big and noisy
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E. Solar Power Stations



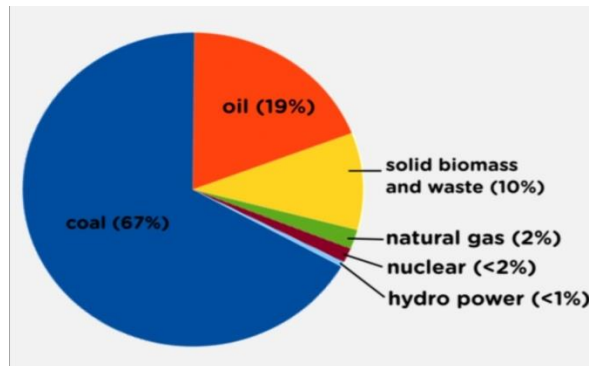
Source: Sun	Sun is a <i>renewable resource</i>
Most power stations are located in Northern Cape Province, South Africa	
Advantages	Disadvantages
<ul style="list-style-type: none"> • It doesn't pollute the air • The Sun is renewable • Cheaper to produce as the Sun is a natural resource 	<ul style="list-style-type: none"> • Only depends on solar panels to convert solar energy to electrical energy • Not sustainable on cloudy days or at night • Solar panels are expensive • Its electricity only powers small appliances like lights and TV, but not enough for stoves

NOTE !!!

There are other forms of power generating sources, namely, ***Gas turbine power, Landfill gas power, and Biomass power***

ACTIVITY

1. Study the pie-chart and answer the questions.



- 1.1 What information is represented by the pie-chart? (2)
- 1.2 Identify a power plant that produces second maximum electricity. (1)
- 1.3 Which power plant is NOT indicated in the pie-chart? (1)
- 1.4 Why coal is the mostly used source to produce electricity?
Give TWO reasons. (4)
- 1.5 What illness is caused by radioactive waste produced by nuclear power plants? (1)

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