



UNIT 5.1 CONVENTIONAL ENERGY RESOURCES

R. M. GROBBELAAR. 2021. ALLEN GLEN HIGH SCHOOL

CONVENTIONAL ENERGY AND THE IMPACT ON THE ENVIRONMENT

- Electricity is taken for granted by most of us but there is a lot that goes into making the light come on at the flick of a switch.
- Coal has to be mined and transported to the power station, a very expensive structure, and then the electricity has to be carried all over the country.
- Coal dominates energy supply in South Africa with 77% of our country's energy needs provided by coal.
- This is unlikely to change in the near future, due to the lack of suitable alternatives to coal as an energy source.
- South Africa produces an average of 224 million tonnes of coal annually, making it the fifth largest coal producing country in the world.
- South Africa the third largest coal exporting country and 25% of our production is exported.
- The important part played by coal can be seen by the fact that Eskom is the 7th largest electricity generator in the world.
- South Africa supplies two-thirds of Africa's electricity.

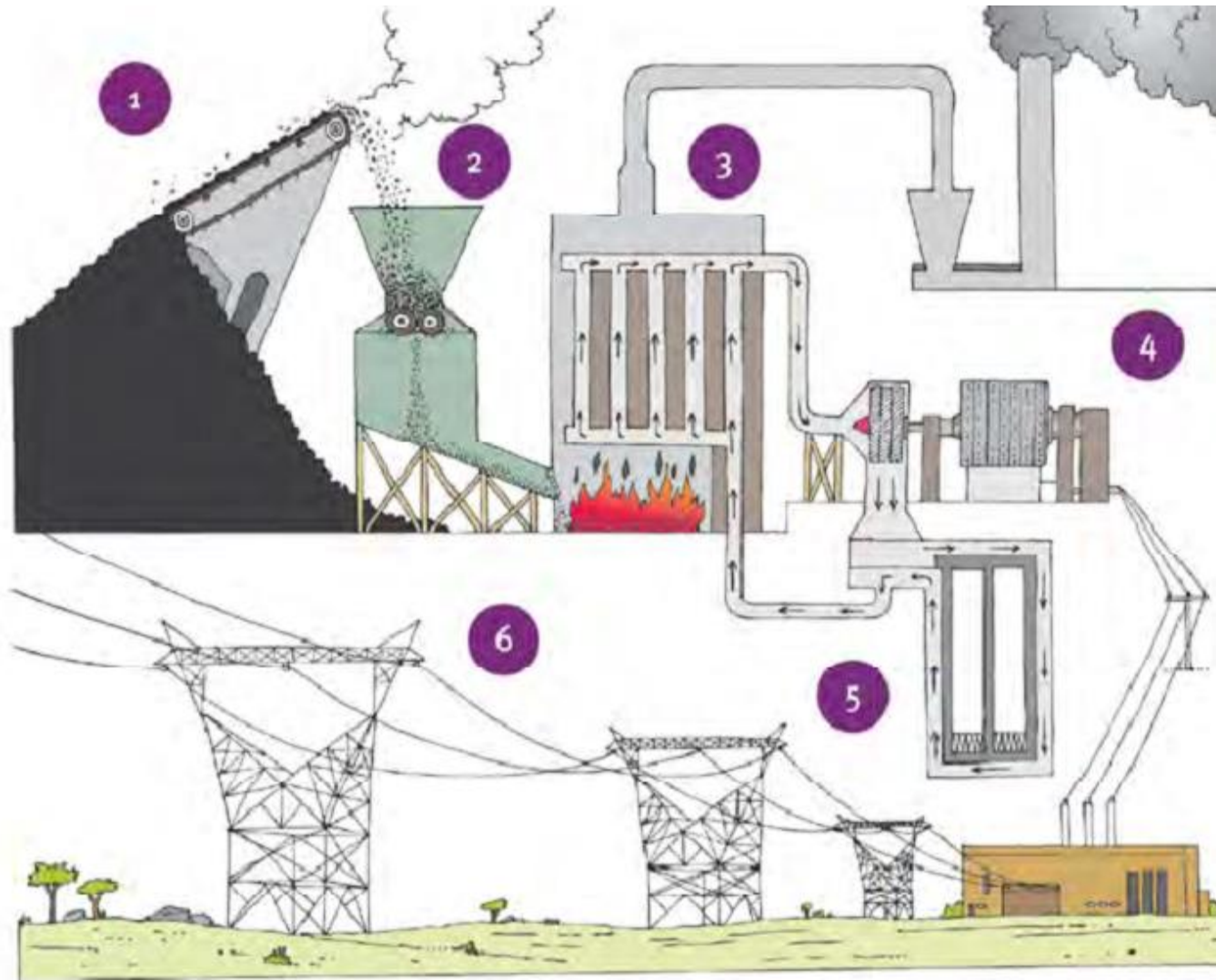


THE PRINCIPLES AND PROCESSES OF GENERATING ELECTRICITY FROM COAL


- Producing electricity in a thermal power station from coal starts when the coal is pulverised in huge mills into a fine powder before it is blown into boilers.
- In the boiler, the coal burns to generate heat to turn water into steam.
- The steam from the boilers is used to turn the blades of a giant fan or propeller, called a turbine.
- The turbine turns a coil made of copper wire inside a magnet – the generator, which produces an electric current.
- Then it is sent to the homes and factories of consumers via power lines.



PRODUCING ELECTRICITY



- 1** Producing electricity in a thermal power station starts with coal extracted from a mine and transported to the power station.
- 2** The coal is **pulverised** in mills into a fine powder before it is blown into huge kettles called **boilers**.
- 3** The coal particles are burned in the boilers, to generate heat to turn water into steam.
- 4** The steam from the boilers is used to turn the blades of a large fan or propeller, called a **turbine**.
- 5** The turbine turns a coil made of copper wire (the rotor) inside a magnet (the stator). Together they make up the **generator**.
- 6** The generator produces an electric current, which is sent to the homes and factories of consumers via power lines.



ADVANTAGES AND DISADVANTAGES OF USING COAL TO GENERATE ELECTRICITY

ADVANTAGES	DISADVANTAGES
SA has abundant coal reserves.	Coal has the most waste problems of all energy sources. Waste includes sulphur and nitrogen oxides, organic compounds, heavy metals, radioactive elements, greenhouse gases and fly ash.
Coal-fired power stations are reliable.	Building a coal-fired power station is a long and expensive process.
South Africa's infrastructure to generate electricity from coal is well established.	South Africa's coal fields are mainly found in Mpumalanga, which limits the location options for power stations.
Burning coal is the most cost-effective and energy efficient way of generating electricity.	