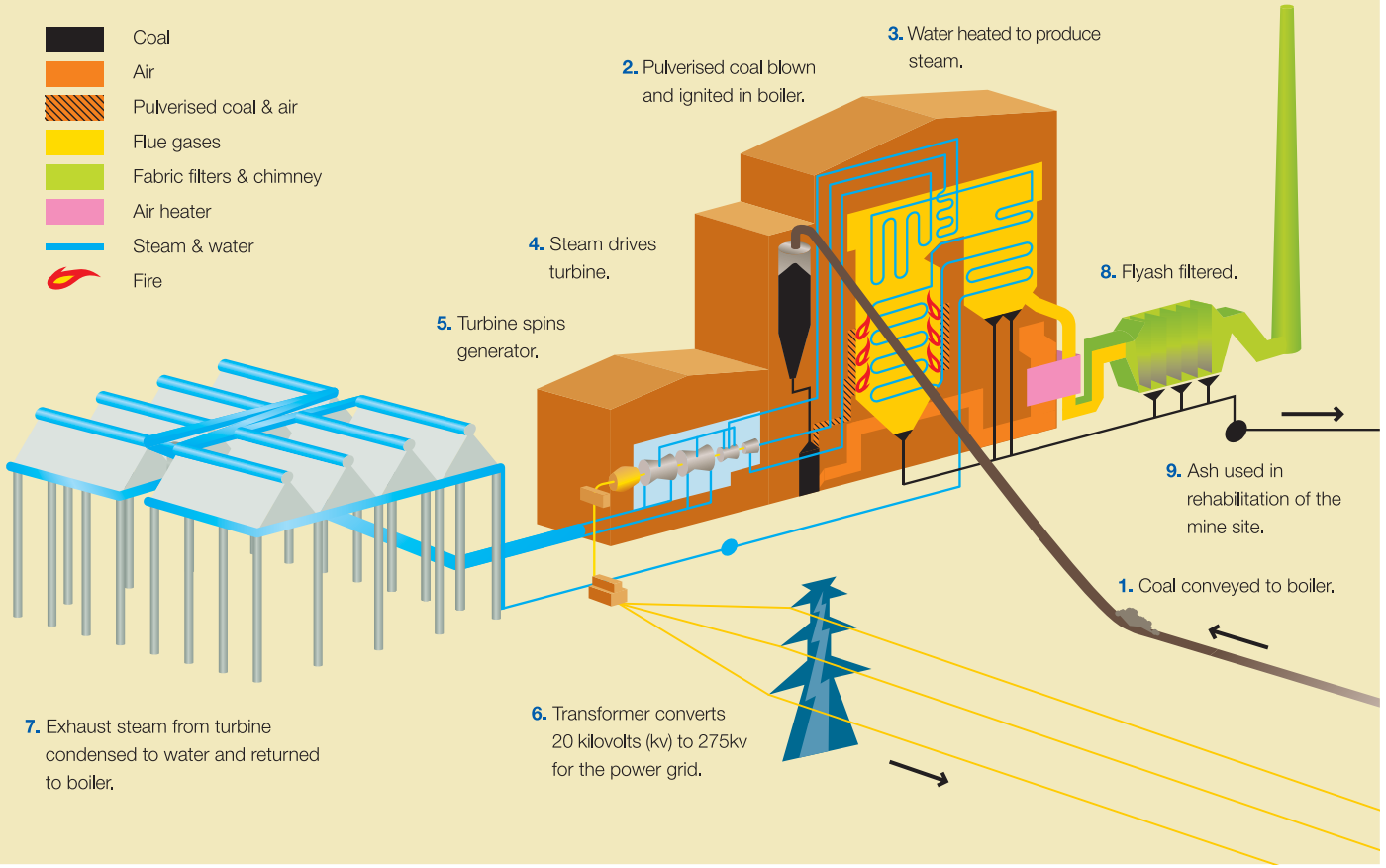
Electricity generation at Kogan Creek Power Station

The electricity generation process

Electricity is generated at Kogan Creek using the following process:

1. Coal from the stockpile is fed to the power station.
2. The coal is ground to a fine powder and mixed with hot air so it can be blown into the burners of the boiler and ignited.
3. The boiler is a large box with walls containing many thin steel tubes filled with water that is pumped under high pressure. The fire in the boiler heats the water, converting it to steam as it rises through the tubes to the top of the boiler.
4. The steam is further heated to very high temperatures before being piped to the turbine. The turbine is made up of many blades and acts like a windmill, with the high pressure steam driving the turbine blades.
5. A generator is attached to the turbine shaft. A powerful electromagnet is mounted on the generator shaft and when it rotates produces electricity in the surrounding generator windings.
6. Electricity is then transported to customers via high voltage transmission lines.
7. The exhaust steam is condensed into water at the air-cooled condenser and then pumped back to the boiler for reuse.
8. The combustion of coal in the boiler produces ash. The exhaust gases carry the ash to a high efficiency bag filter system, which removes ash from the flue gas before it discharges up the chimney.
9. Ash is placed back in the mine site.



Technical Information

General

Capacity	750 MW
Units	1
Transmission voltage	275 kV
Fuel	Black coal
Quantity of coal burnt per year	2.8 million tonnes
Quantity of water used per year	< 1,000 megalitres

Turbine

Type	Steam
Manufacturer	Siemens
Rotational speed of steam turbine and generator	3000 revolutions per minute
Number and diameter of exhaust steam ducts between the steam turbine and air cooled condenser	2 ducts each having a diameter 6 metres
Number of fans in air cooled condenser and diameter of each fan	48 fans each with a diameter of 9 metres

Boiler

Manufacturer	Babcock Hitachi Kure (BHK)
Steam Pressure	250 Bars (3628 psi) (25Mpa)
Furnace temperature	1,400 ˚C
Main steam temperature	540 ˚C
Reheat steam temperature	560 ˚C
Steam flow from boiler	616 kg/sec
Flue gas temperature	140 ˚C
Height of boiler	70 metres
Height of boiler chimney	160 metres