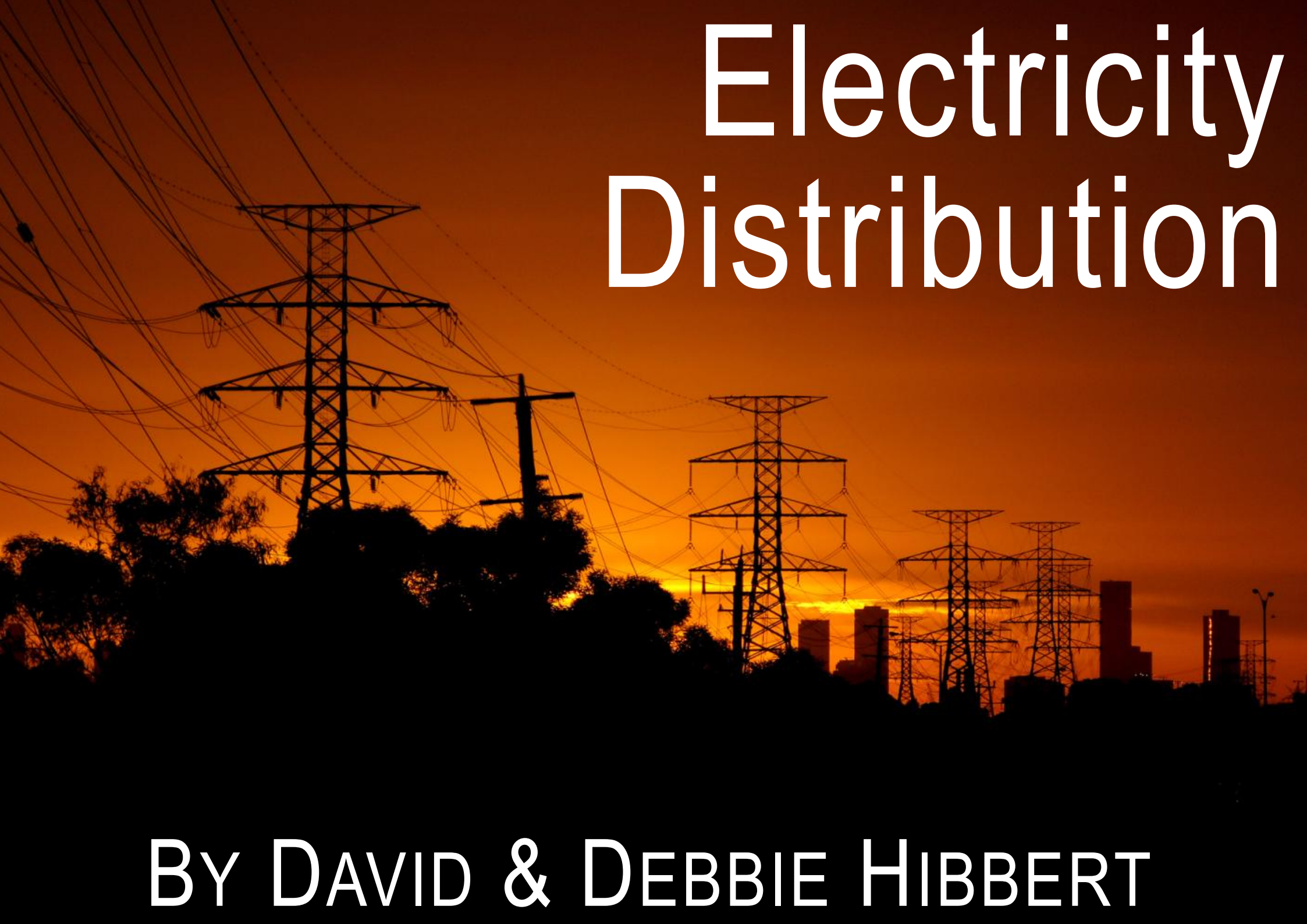


Electricity Distribution

The background of the slide is a photograph showing several high-voltage electricity pylons and power lines stretching across the frame. The scene is set against a bright orange and yellow sunset sky, with the sun low on the horizon. In the foreground, there are dark silhouettes of trees and a city skyline in the distance.

BY DAVID & DEBBIE HIBBERT



Electricity Distribution

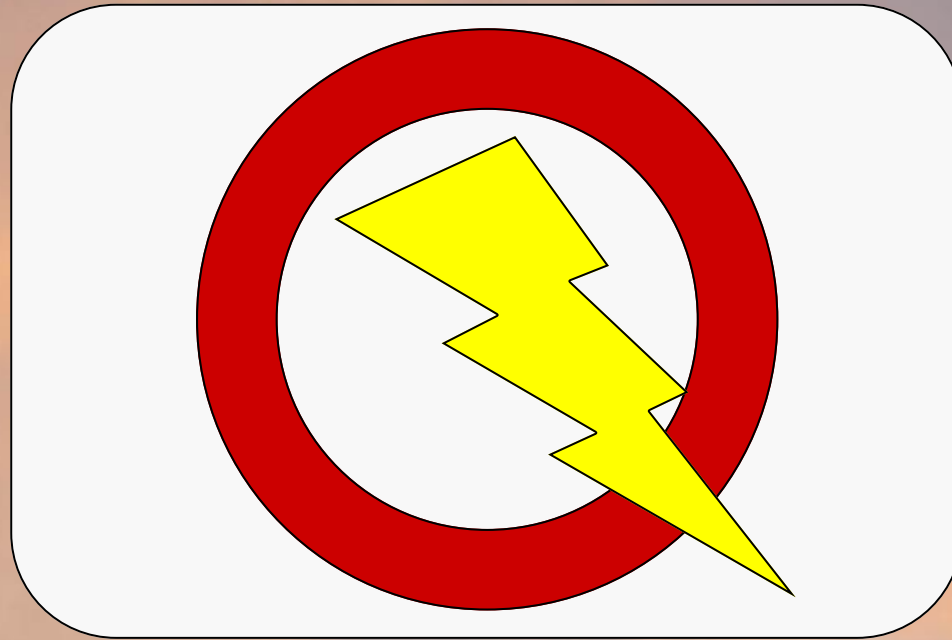
- David & Debbie Hibbert -

Electricity is an invisible energy resulting from the existence of charged particles (electrons and protons). These form an electrical current or static charge.

An electrical current is produced when electrons move along a conductor such as an electrical wire. Electrons can move back and forth (AC - Alternating Current) or in one single direction (DC - Direct Current). Both AC or DC can kill humans.



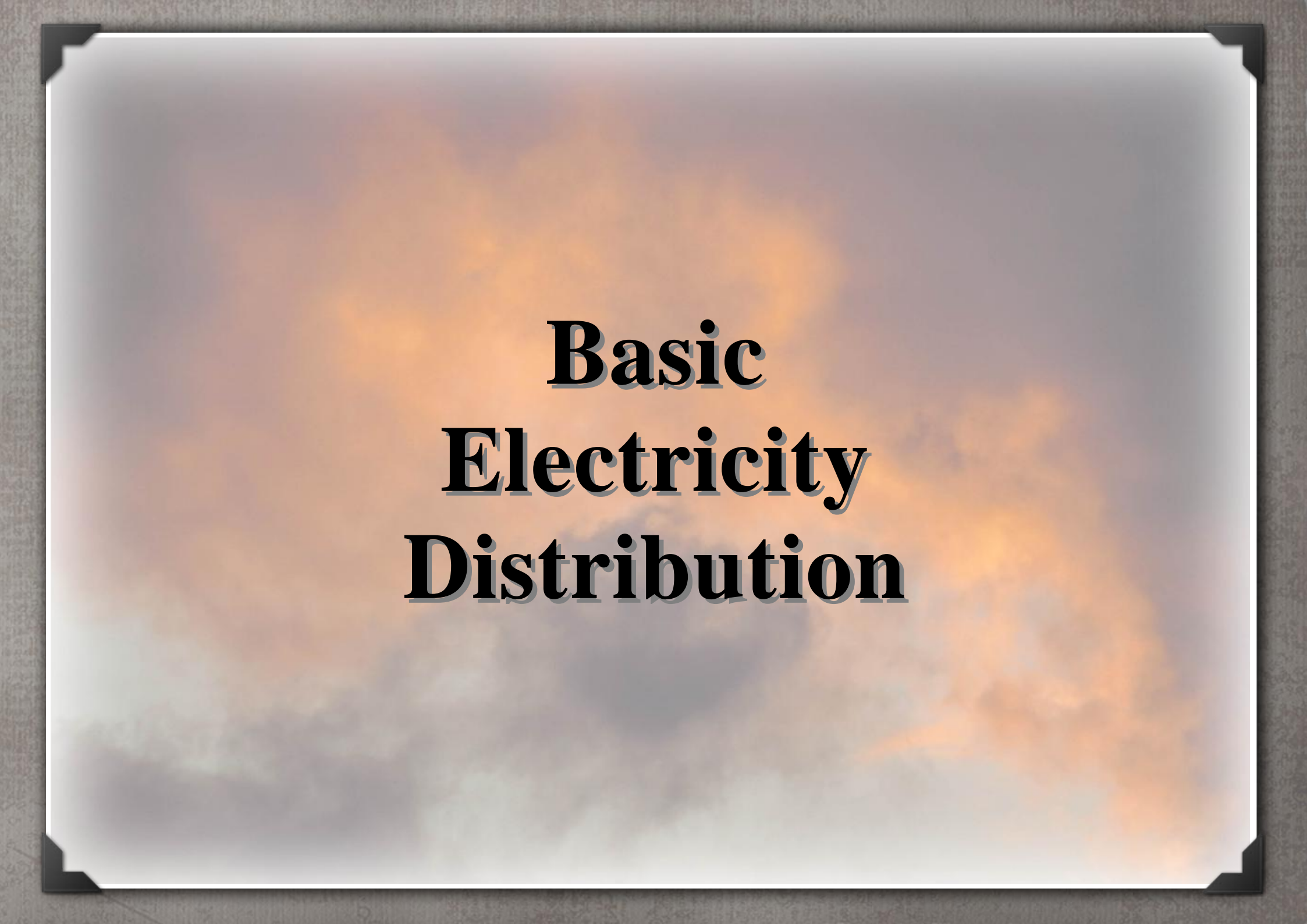
DANGER!



Electricity is invisible to detect and can kill.

Never interfere with electrical devices or wiring.

Only an Electrician is qualified to work with electricity.

The slide features a background of soft, ethereal clouds in shades of grey, blue, and orange, suggesting a sunrise or sunset. The entire slide is framed by a white border with black corner mounts.

Basic Electricity Distribution

BASIC DISTRIBUTION

The production of electricity is called Generation.

The transfer of electricity is called Distribution.

The supply of electricity to customers is called Supply.

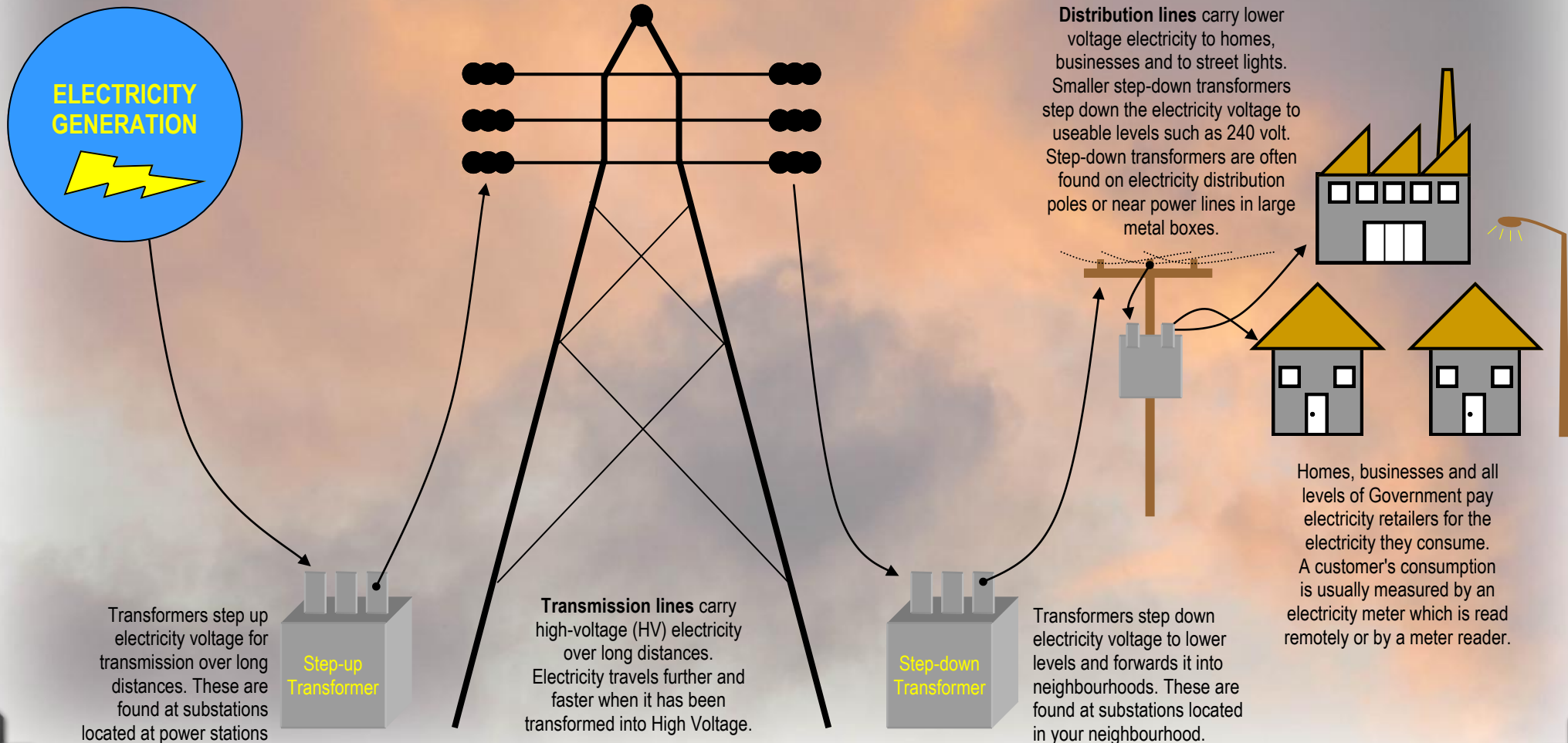
BASIC DISTRIBUTION

Electricity is generated in one location and is distributed to paying customers in another location via high voltage (HV) transmission lines and low voltage (LV) distribution lines (power lines).

Customers include homes, businesses and Governments who use electricity for things such as street lighting.

BASIC ELECTRICITY DISTRIBUTION

GENERATION	DISTRIBUTION				SUPPLY
ELECTRICITY GENERATION	HIGH VOLTAGE SUBSTATION	TRANSMISSION LINES across longer distances	LOW VOLTAGE SUBSTATION	DISTRIBUTION LINES across shorter distances	SUPPLY To homes, businesses and street lights





Power Generation

GENERATION

Electricity can be generated in mechanical and chemical based systems, and is also produced naturally in nature

ELECTRICITY GENERATION

Mechanical

Turbines are spun which rotate generators and alternators to generate useable electricity:

Coal

(Burning coal > steam > turbines)

Gas

(Natural Gas > steam > turbines)

Hydroelectric

(Water movement > turbines)

Wind

(Wind power > turbines)

Waves

(Wave power > turbines)

Nuclear

(Nuclear Fission > steam > turbines)

Geothermal

(Heat from the earth > steam > turbines)

Chemical

Chemicals create a reaction that produces useable electricity:

Photoelectric

(Solar energy from sunlight)

Batteries

(Car and truck batteries)

(Small batteries for electronic devices)

Fuel Cells

(Converts Hydrogen and Oxygen into water, producing electricity as a by-product)

Battery Storage

(Electricity can be stored for long periods)

In Nature

Nature produces electricity in small amounts or in unusable forms:

Lightning (large static discharge)

Static electricity

Heat differential

Piezoelectric crystals & ceramics

Glowing insects

Human body's nervous system and heart's pacemaker

COAL



Coal is dug from large open-cut mines for use in coal fired Power Stations

A fire started at this open-cut mine on 9 February 2014 and burnt for 45 days.

COAL



Burning coal produces heat. This is used to make steam that turns large electricity generating turbines

COAL



There are different kinds of coal powered power stations, however they all use steam to make electricity

When operational, it was the world's least efficient carbon power station, finally closing on 31 March 2017

COAL

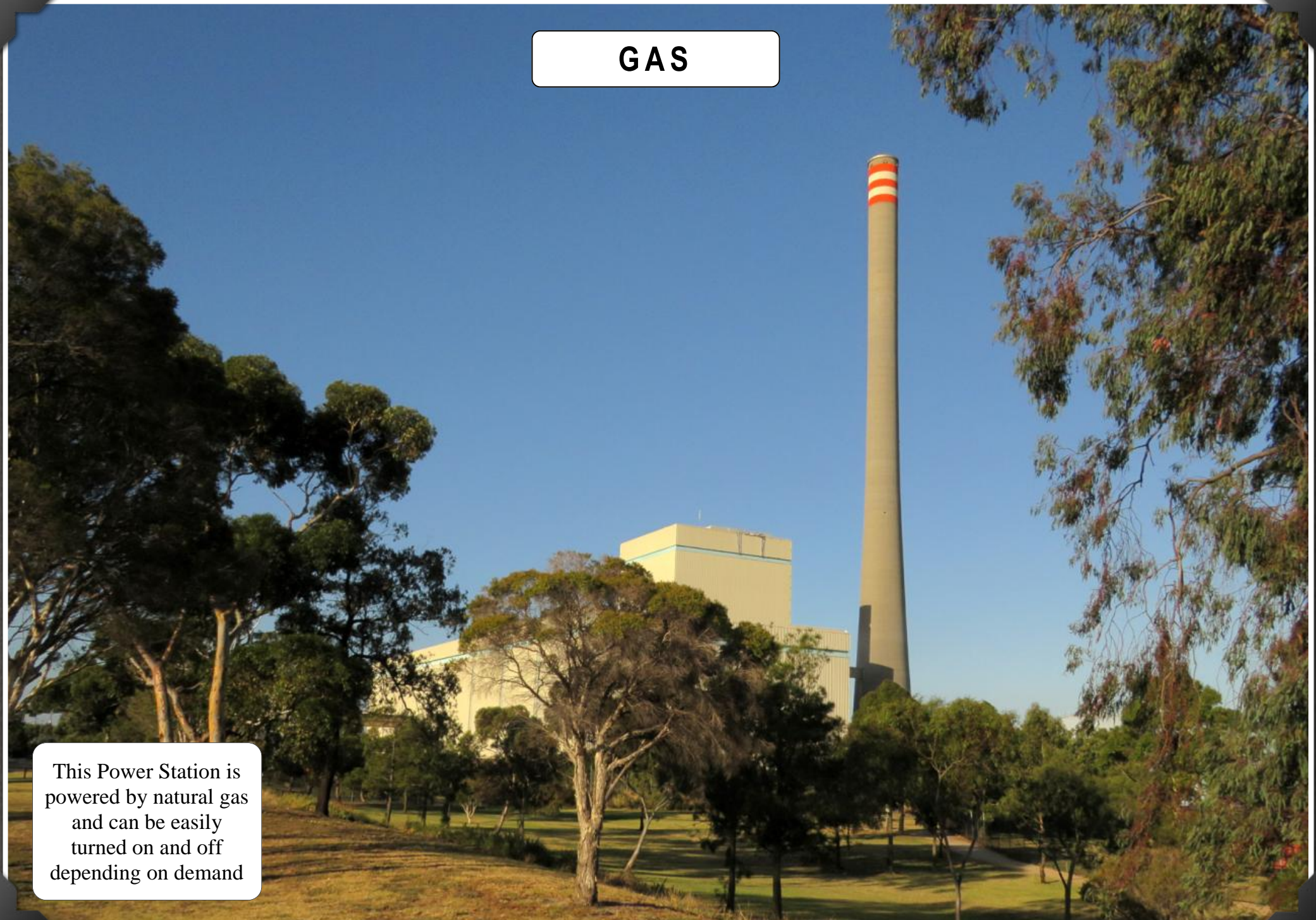


There are different kinds of coal powered power stations, however they all use steam to make electricity

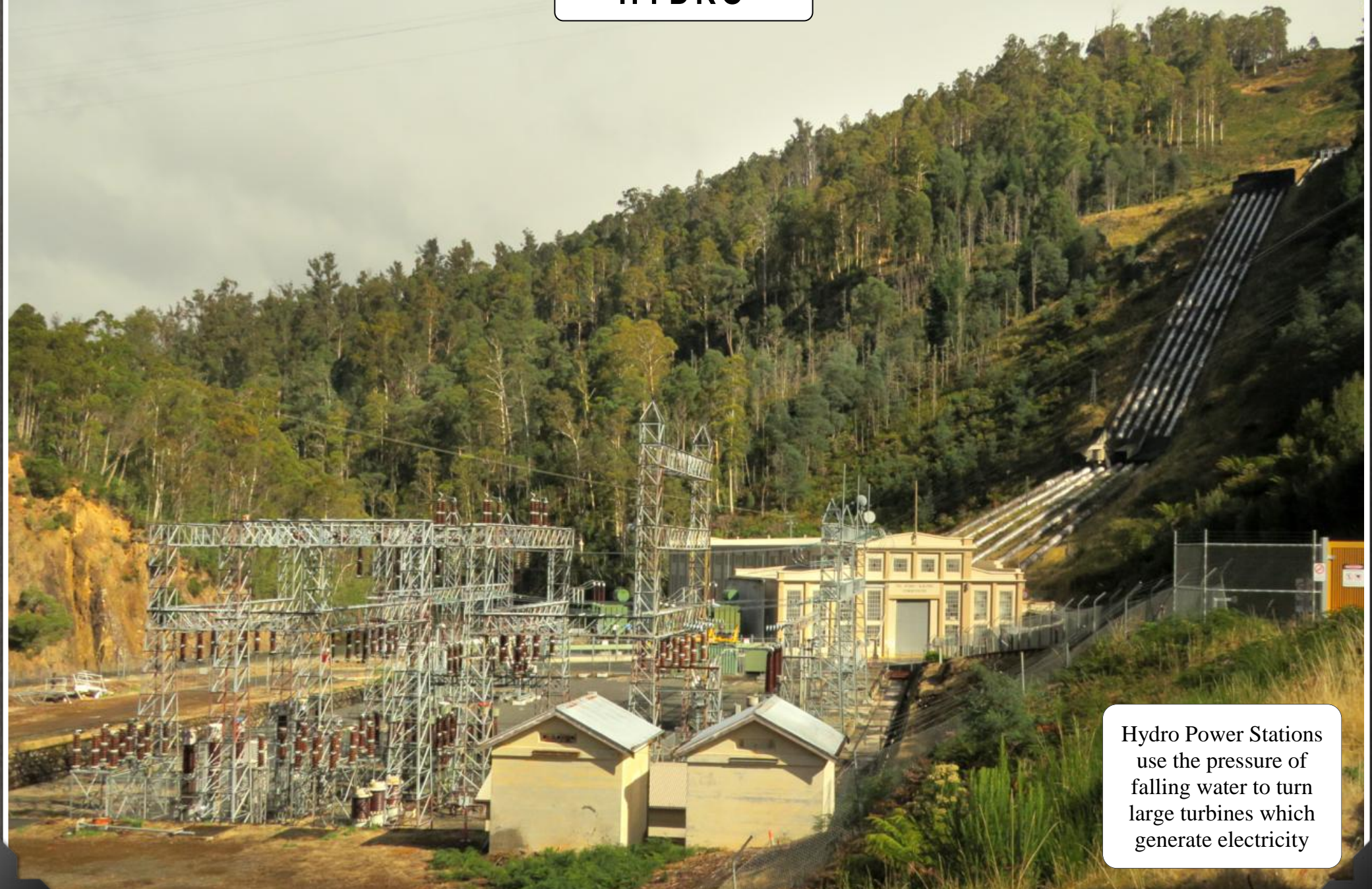
This Power Station closed in August 2014

GAS

This Power Station is powered by natural gas and can be easily turned on and off depending on demand



HYDRO



Hydro Power Stations use the pressure of falling water to turn large turbines which generate electricity

WIND

Wind Farms use wind to turn large turbines which generate electricity



SOLAR



Solar Farms produce electricity from the energy of the sun

SOLAR



Solar Farms produce electricity from the energy of the sun

SOLAR



Solar Farms produce electricity from the energy of the sun

High Voltage (HV) Substation

Transforming newly generated electricity into a Higher Voltage using Step-up transformers, so it can be transferred to customers

SUBSTATION AT A HYDRO POWER STATION



Substations are found at all power stations and are used to prepare high voltage electricity so it can be sent over great distances

Transmission Lines

Distributing High Voltage (HV) Electricity across Great Distances

ELECTRICITY IS TRANSFERRED FROM ONE SPOT TO ANOTHER USING CABLE



CABLES ARE SUSPENDED ON TRANSMISSION LINES AND POLES

























THROUGH FOG



IN SUMMER



IN WINTER



Step-down Transformers

Stepping down High Voltage (HV) Electricity to Low Voltage (LV) for Customers

STEP-DOWN TRANSFORMER PRODUCING A LOWER VOLTAGE



STEP-DOWN TRANSFORMERS COME IN DIFFERENT STYLES



STEP-DOWN TRANSFORMER PRODUCING A LOWER VOLTAGE



Distribution Lines

Distributing Low Voltage Electricity to Paying Customers

MEDIUM VOLTAGE DISTRIBUTION LINES

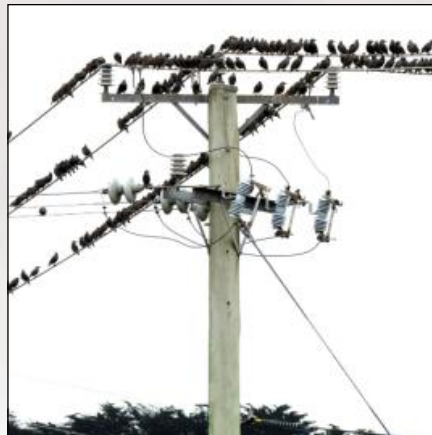


LOW VOLTAGE (240 VOLT) DISTRIBUTION LINES



DID YOU KNOW

A single bird sitting on a power cable will not be electrocuted. But if that bird forms a circuit by touching another bird sitting on another power cables, electricity will flow through the first bird and into the second bird, killing them both.

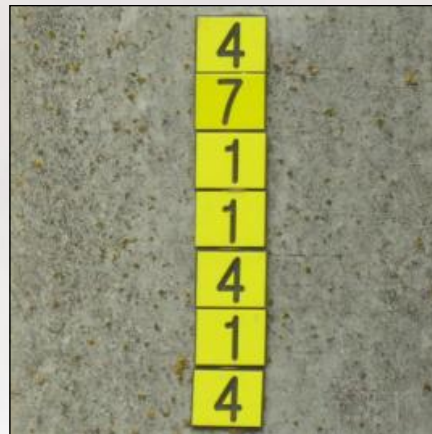


LOW VOLTAGE DISTRIBUTION LINE



DID YOU KNOW

Each Victorian Distribution Pole has a number which is unique to that pole. These numbers are shared between electricity distribution companies and are able to be used in an emergency to accurately locate that pole on a map. This means that emergency services can arrange for power company employees to be sent to the correct location.



Supply

Supplying Electricity to Specific Paying Customers

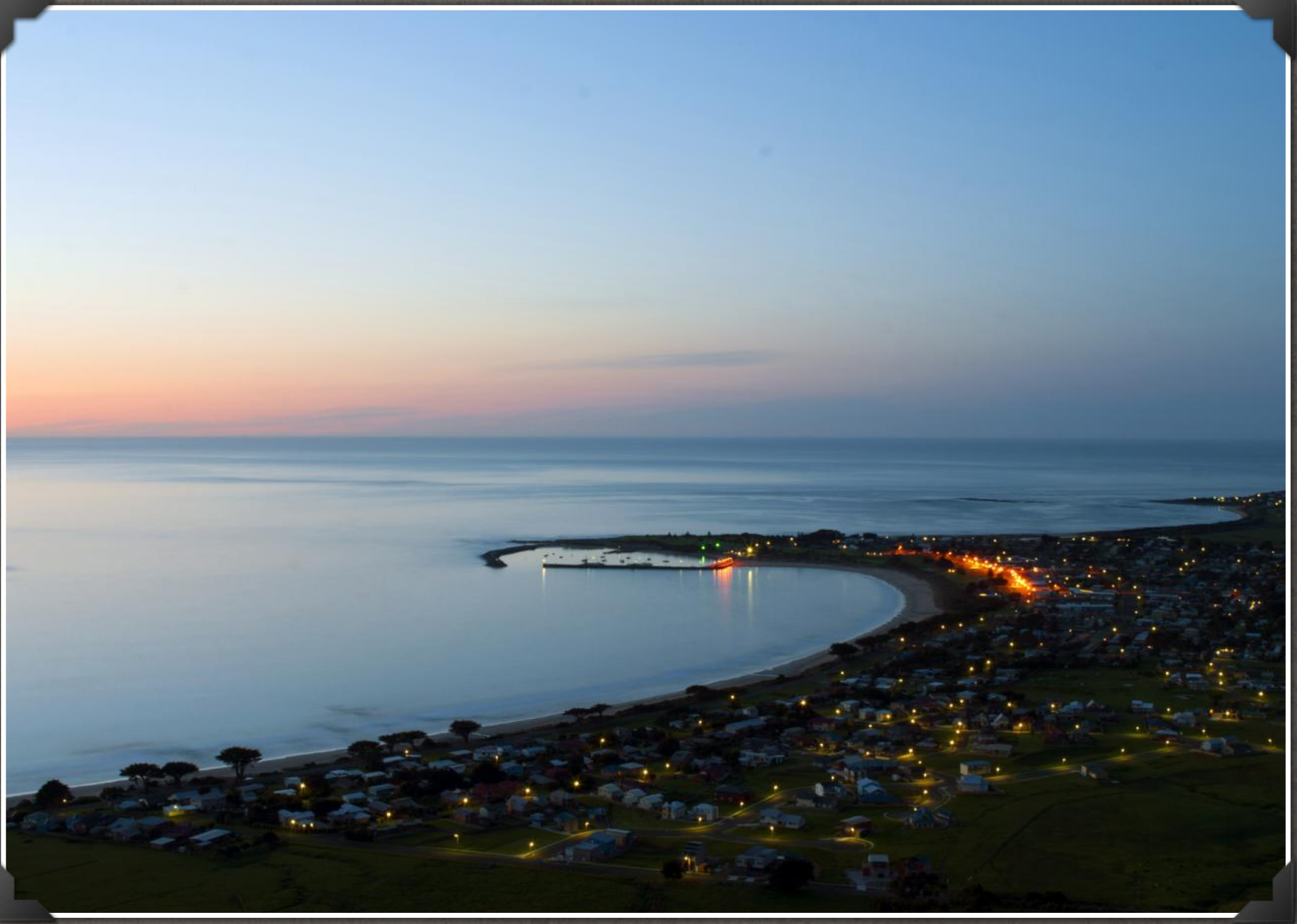
HOUSEHOLD CONNECTION POINT - SINGLE PHASE POWER (240 VOLT)



BUSINESS CONNECTION POINT - THREE PHASE POWER (PROVIDING UP TO 415 VOLT)

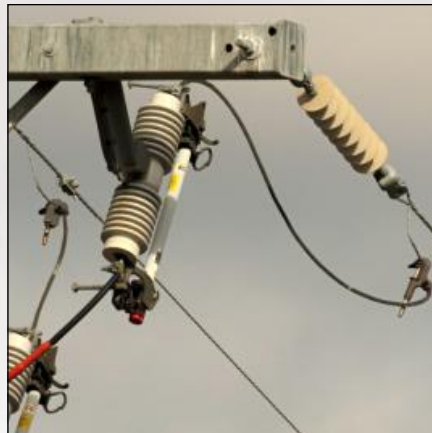


APOLLO BAY STREET LIGHTING



DID YOU KNOW

The distribution of electricity is only possible due to insulators, which do not allow electricity to pass through them. Insulators stop the electricity from moving from the wires, down the pole and into the ground.





ELECTRICITY FACTS

The flow of electrons along a conductor is called a current. A conductor is any material that allows electricity to pass through it. An insulator is any material that restricts the flow of electricity through it.

An electric charge is measured in Amps and can be measured with Amp-meters. The pressure (potential) of an electric charge is measured in Volts and can be measured using a Volt-meter.

A static charge is the build-up of electricity on a stationary surface such as a jumper, and can range to more than 3000 volts. Lightning can be over three million volts and travel at the speed of light. Electric eels produce electric shocks greater than 500 volts.

Benjamin Franklin did not discover electricity as many suppose, but he did prove that electricity could produce lighting.

The first battery was created by Alessandro Volta over 200 years ago and the first power station (power plant) was established in the American city of New York in 1882 by Thomas Edison. Thomas is credited with over 1000 other inventions, including electrical devices such as switches, fuses and meters for measuring electricity use.

In 2017 billionaire Elon Musk (Tesla) made history by installing the worlds largest lithium-ion battery backup system (for mains power) ever built at that time. It was constructed in South Australia with an operating (holding) capacity of 100 megawatts. Elon promised he would install it in 100 days or it would be free—and he did.

Electricity will always try to find a path to the ground. This will include through people if they get in the way. Most people who die from electrocution when they touch a wire or a metal object that is electrified.

The human heart only needs a minute amount of electric current to stop it beating.

'epic'

epic - (adjective) *Surpassing the usual or ordinary*

ePic - (noun) *Illustrated by **electronic pictures***



The free Artworkz 'ePic Photo Group' eMagazine

Special thanks to Allan Layton and Kathie Maynes

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