

# 3

# ELECTRICITY GENERATION



**ENERGY  
EDUCATION  
TOOL KIT**

BY INSIDE EDUCATION

## Turn on a light using natural gas!

First, we dig wells to extract the out of the ground. The natural gas

then is sent through a small to a plant where it is burned. The burning

natural gas combusts to turn a . Meanwhile, waste heat is used to heat up

. The water boils and turns to that rises to turn another

. The spinning turbines activate a . Inside the generator

there is a spool of surrounded by . The generator generates

**ELECTRICITY**! The electricity travels through into a

. When you turn on a you complete a circuit that sends

the electricity to a , turning it on!

**magnets**

**natural gas**

**copper wire**

**turbine**

**light bulb**

**water**

**house**

**turbine**

**turbine**

**generator**

**steam**

**pipeline**

**transmission lines**

**light switch**

### Real World Example!

In 2020, construction began on the Cascade power plant near Edson, Alberta. It is a combined-cycle gas turbine power plant that will provide power for about 900,000 homes and business in Alberta. It is expected to produce 62% less carbon dioxide ( $CO_2$ ) per MWh compared to current coal-powered electricity generation facilities.



(credit: Cascade Power Project)



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## Turn on a toaster using wind power!

Wind turbines are metal structures that are about \_\_\_\_\_ metres tall. The power of the

 \_\_\_\_\_ pushes on the giant \_\_\_\_\_, which spins an internal shaft

connected to a \_\_\_\_\_. The gears work to increase the speed of  \_\_\_\_\_ by a

factor of 100, which then activates a \_\_\_\_\_ to produce **ELECTRICITY!**

The higher the wind \_\_\_\_\_, the more electricity is generated. The electricity travels

through  \_\_\_\_\_ into your home. When you plug in your , electrons flow

through the cord and heat up the wires that are spaced apart to toast your bread!

**rotation**

**blades**

**80**

**toaster**

**wind**

**generator**

**speed**

**transmission lines**

**gear box**

### Real World Example!

Constructed in 2012, Capital Power's Halkirk Wind Farm in East-Central Alberta has 83 wind turbines and produces 150MW of electricity. Capital Power has received approval from the Alberta Utilities Commission (AUC) to develop Halkirk 2, a second wind farm that will install another 74 turbines in the same area.

