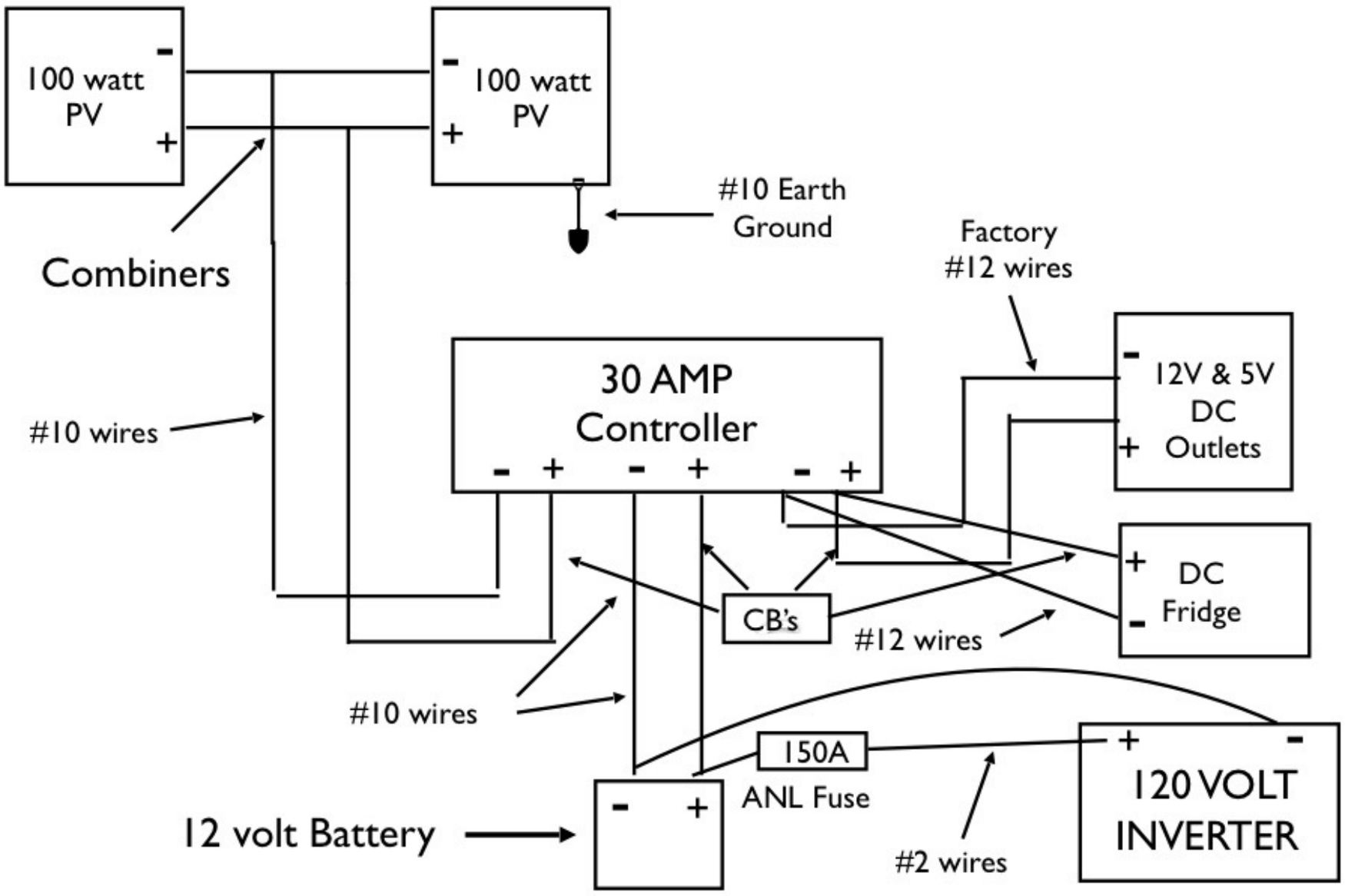
your system

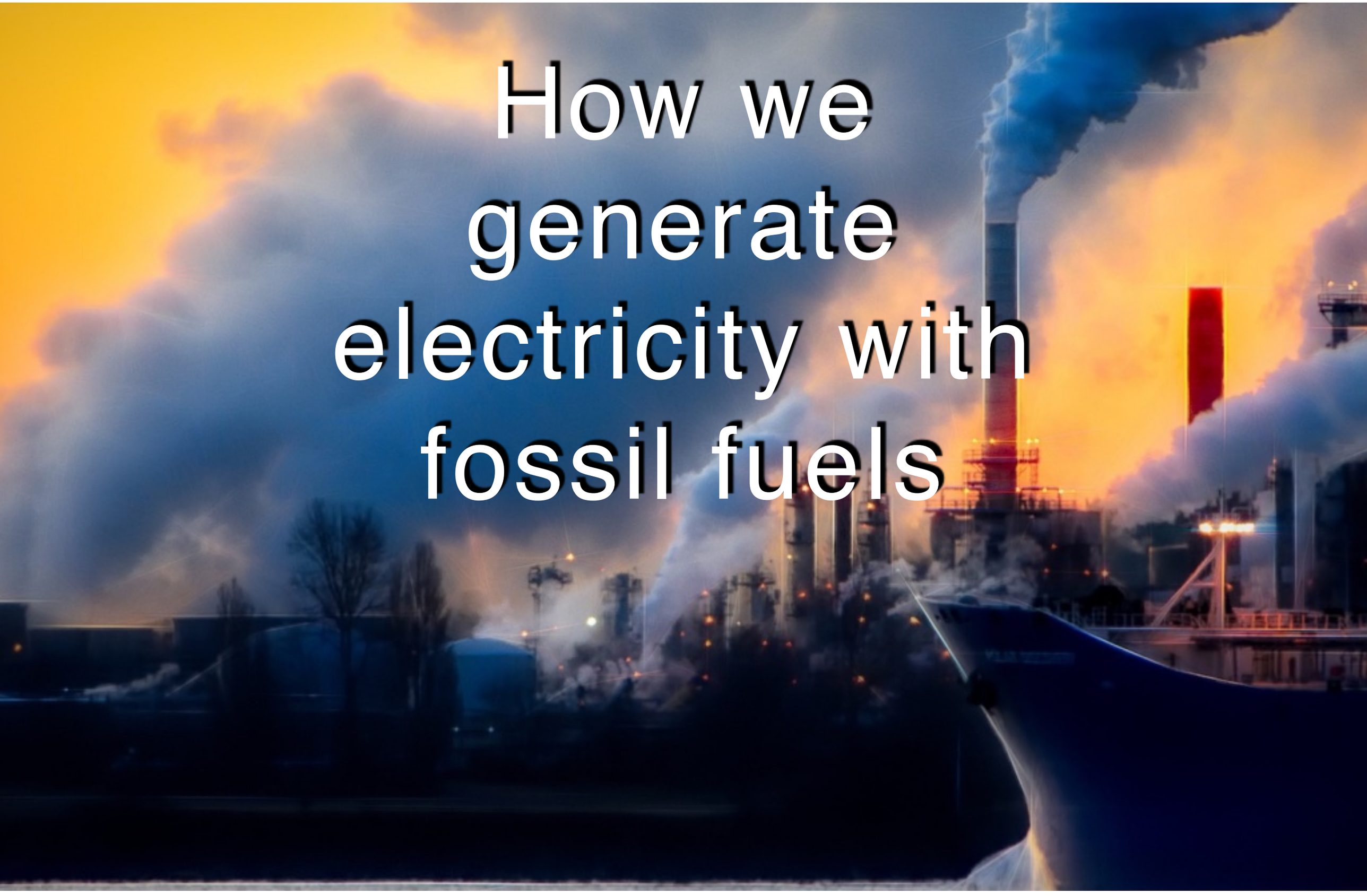
Gallup Solar 12 Volt Hogan Basic System



Electricity Generation

Class 1 for Gallup Solar Team 7

How we generate electricity with fossil fuels



When fossil fuels* are burned
to generate electricity,
they release carbon dioxide
and other greenhouse gases,
which trap heat in our atmosphere,
making them the primary contributors
to global warming and climate change

*Fossil fuels are made from decomposing plants and animals. These fuels are found in the Earth's crust and contain carbon and hydrogen which can be burned for energy.

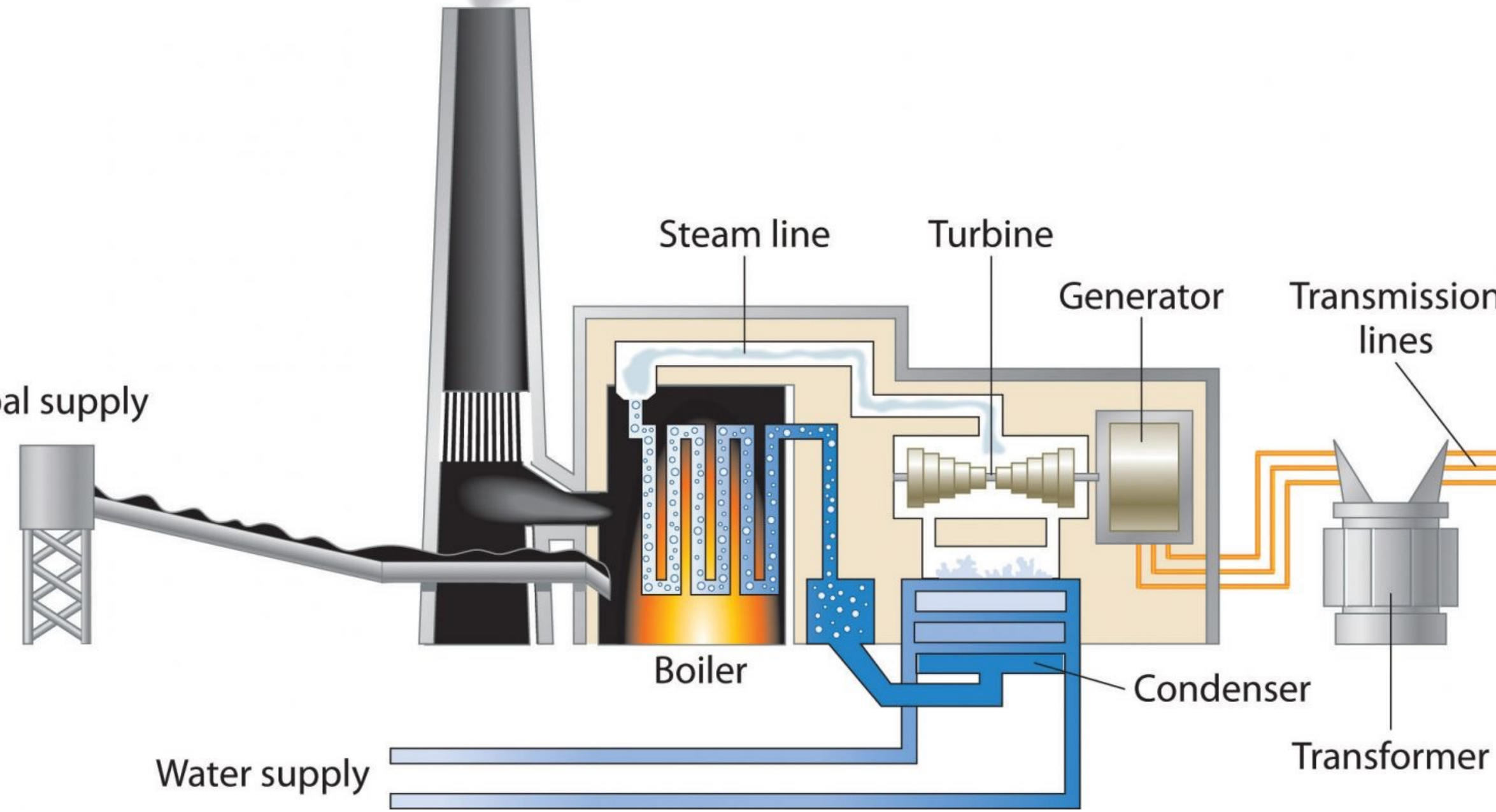
*Coal, oil, and natural gas are fossil fuels.

CO2 & Greenhouse Gases

Coal

This San Juan Generating Station is to be demolished and a 200 Megawatt Solar Plant will replace the power it was producing.

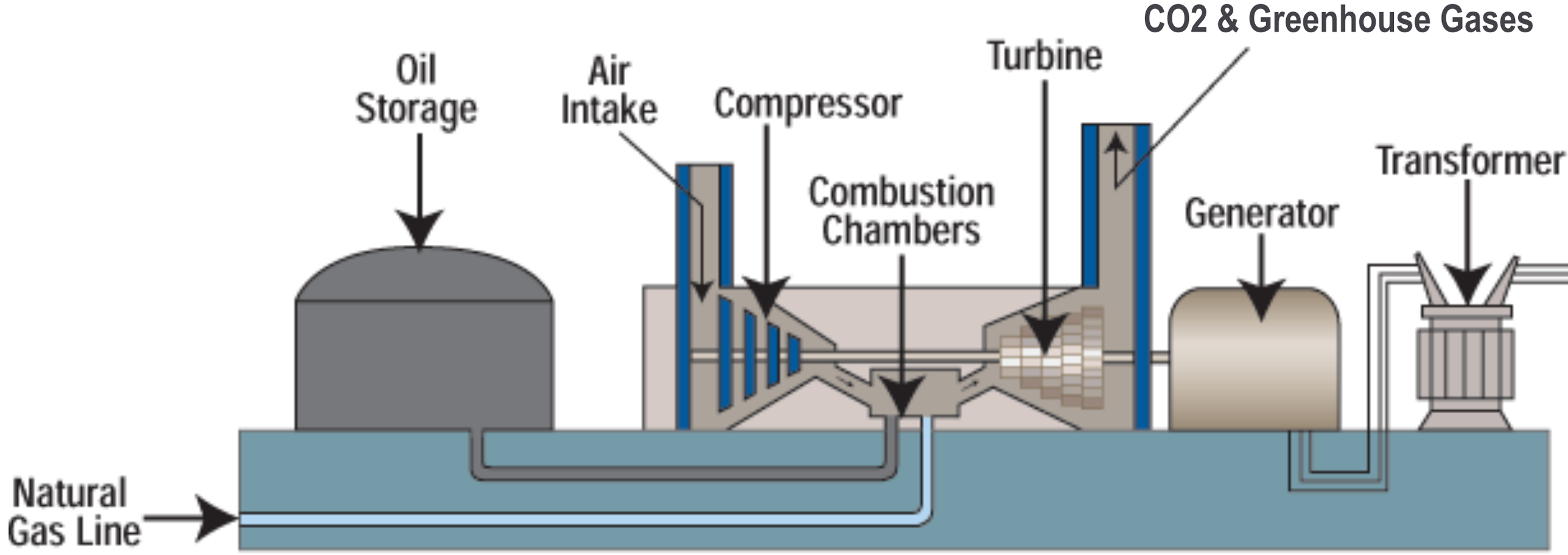
CO2 & Greenhouse gases



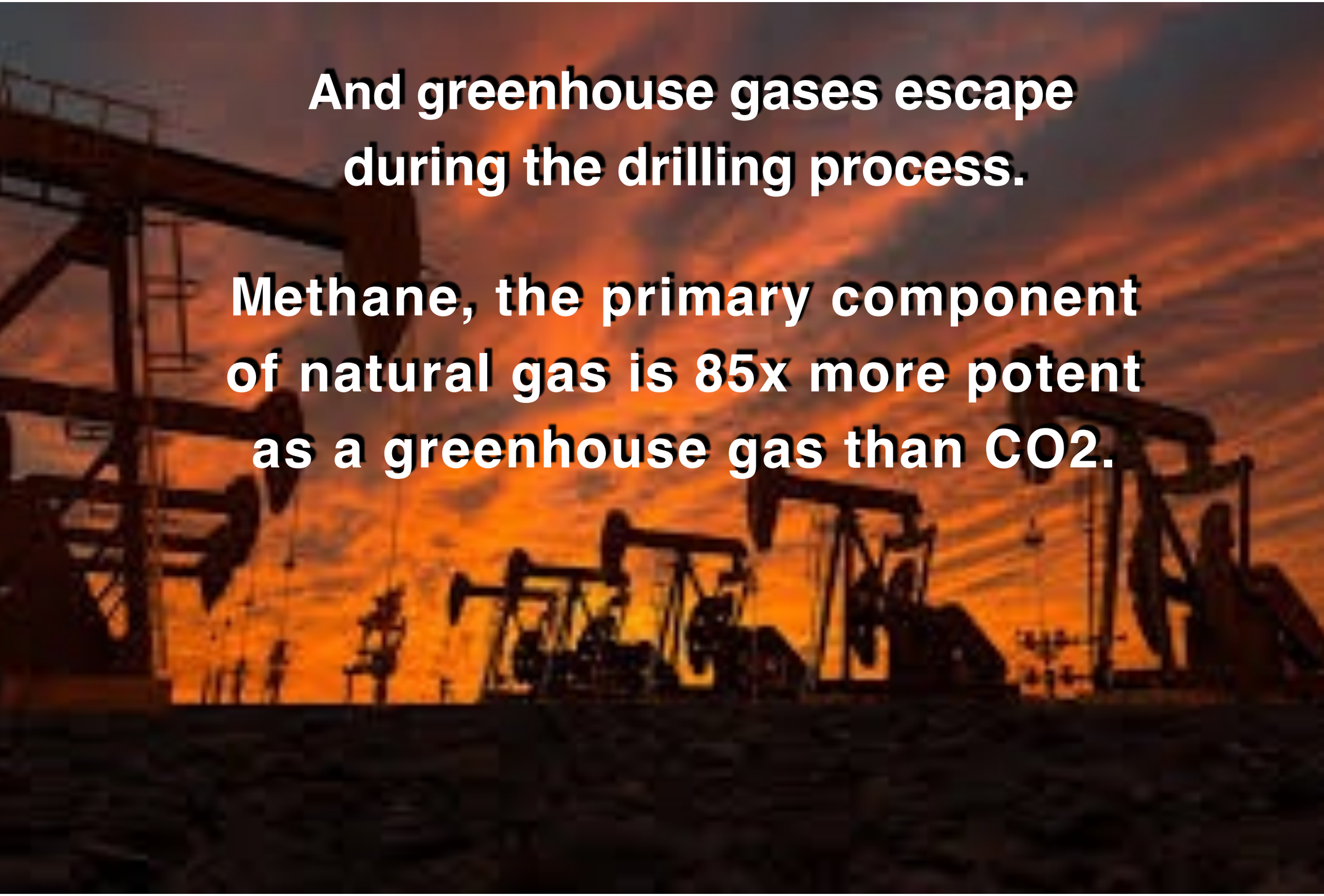
Steam created by burning coal
turns Turbine which turns Generator.

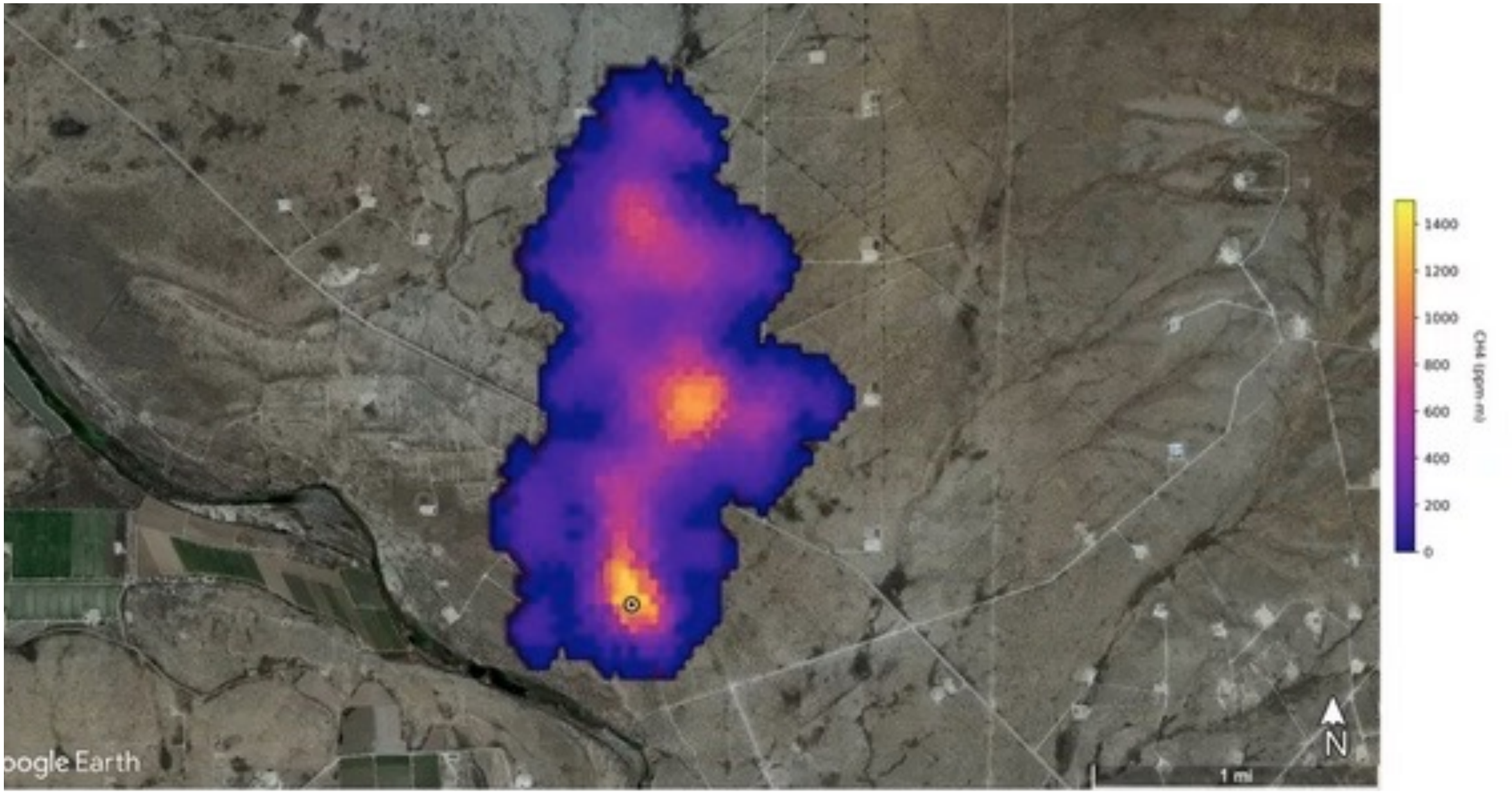
Natural Gas

CO2 & Greenhouse Gases



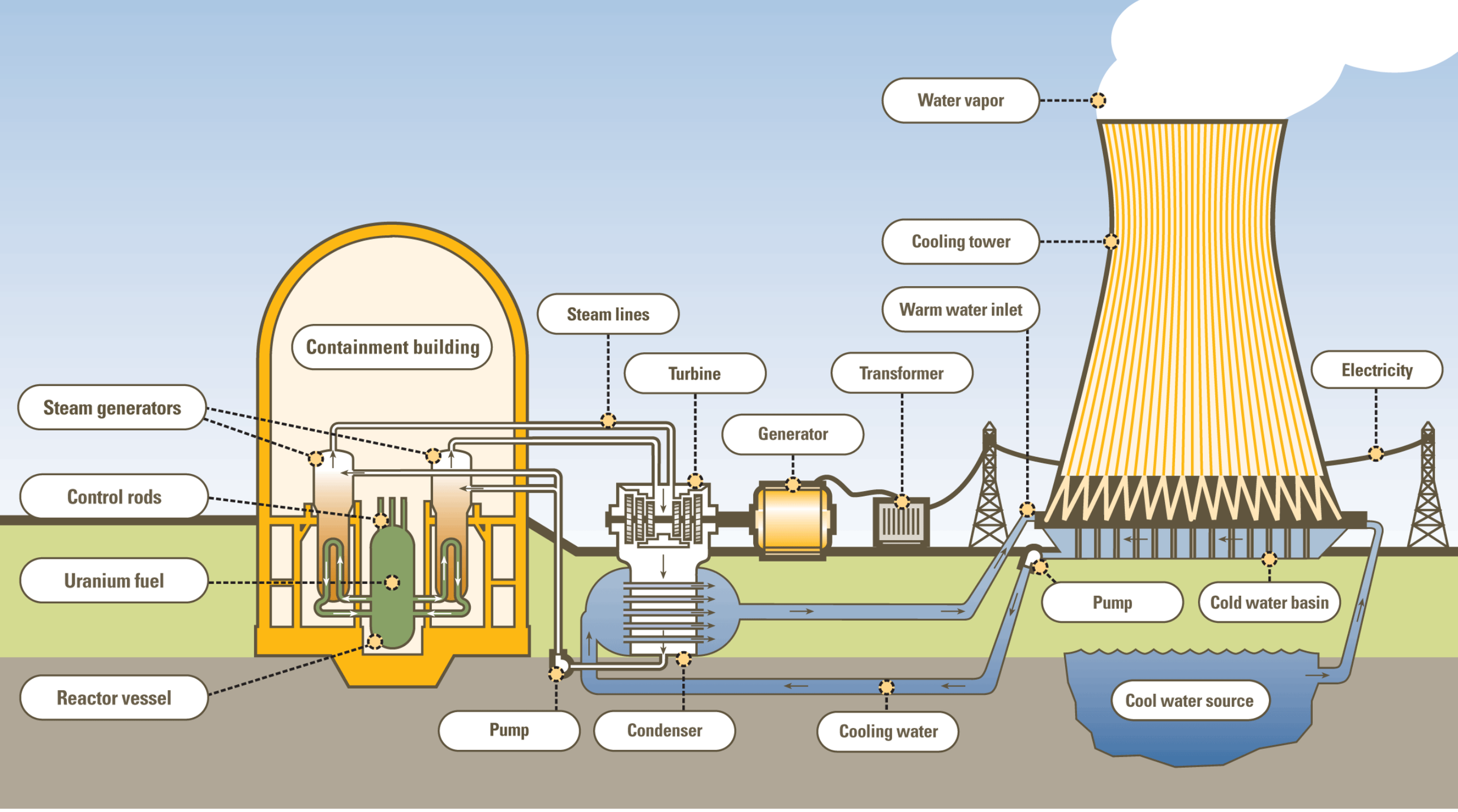
Heat from
gas combustion
turns Turbine which turns Generator.


And greenhouse gases escape
during the drilling process.
Methane, the primary component
of natural gas is 85x more potent
as a greenhouse gas than CO2.



Some of the largest clouds of heat trapping methane gas ever detected are floating over the drilling fields in Permian Basin in New Mexico.

Nuclear



Steam, heated by uranium fueled control rods, turns Turbine which turns Generator.

You thought it was more complicated than that?

Nuclear doesn't produce greenhouse gases, but it does produce radioactive waste.

Fukushima 2011

And a bad history here

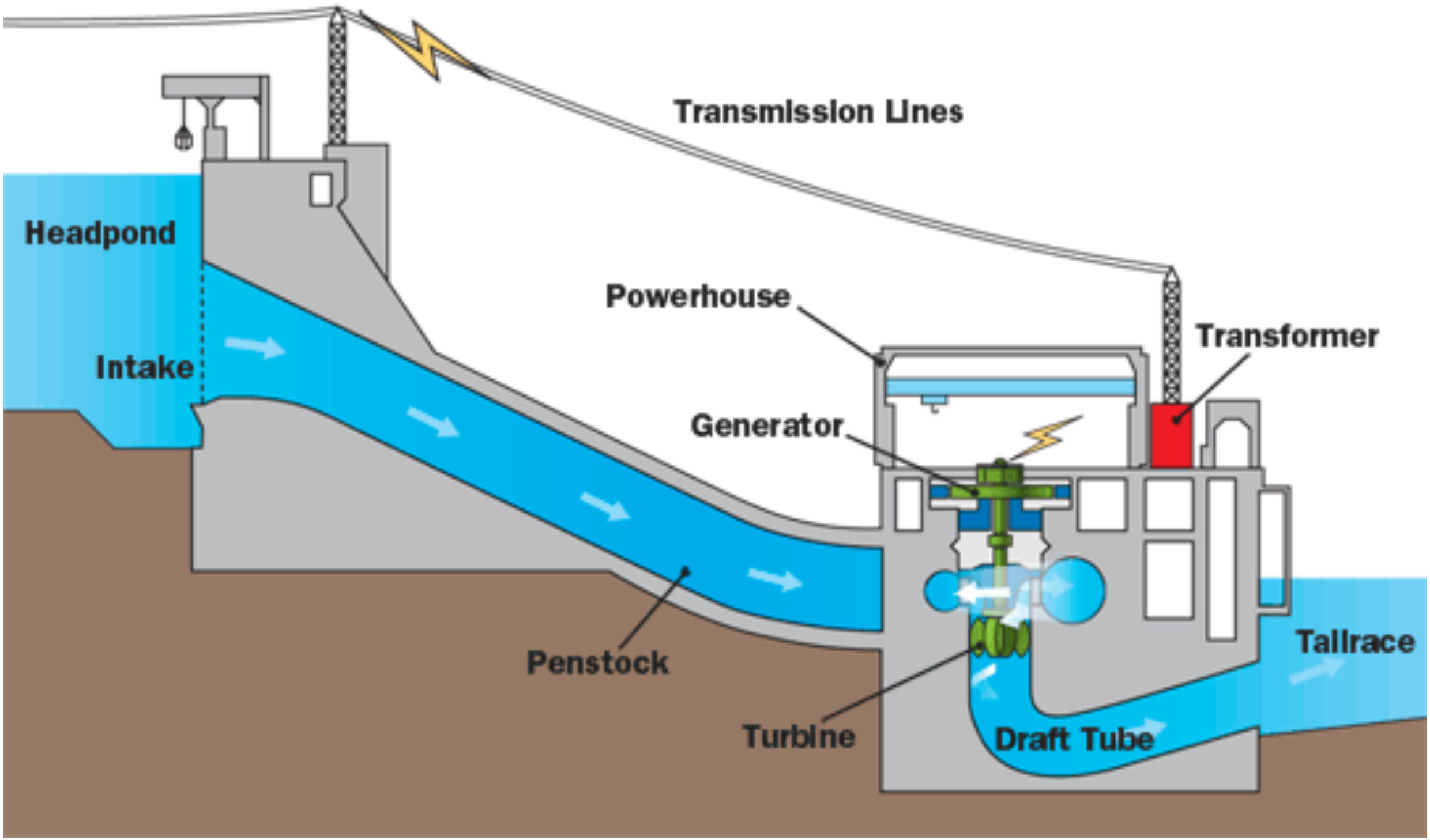
Church Rock spill in 1979 and some want to start up again.

We also generate electricity with renewable energy.

Renewables don’t get used up

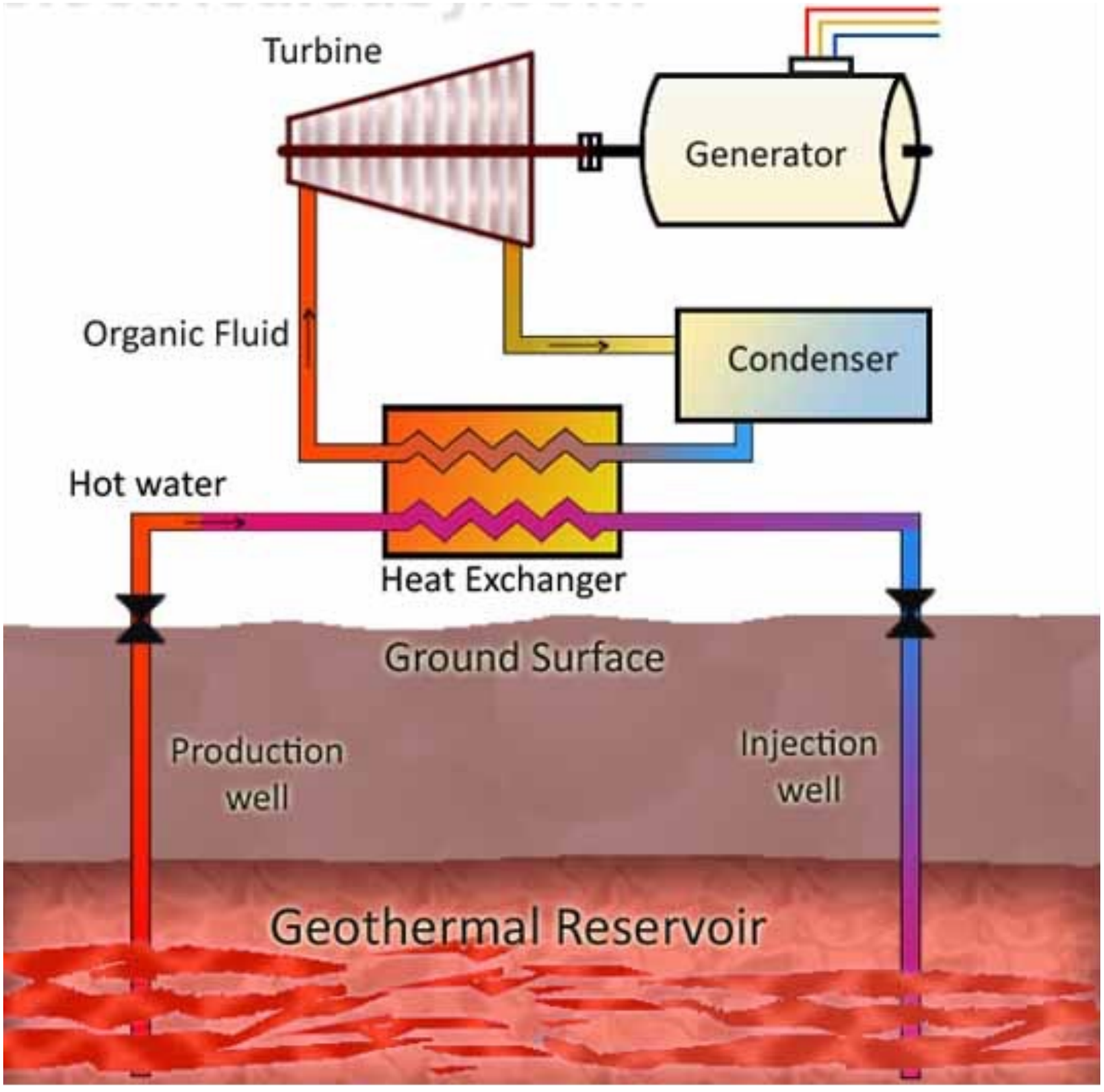
and they don’t produce greenhouse gases.

Hydroelectric



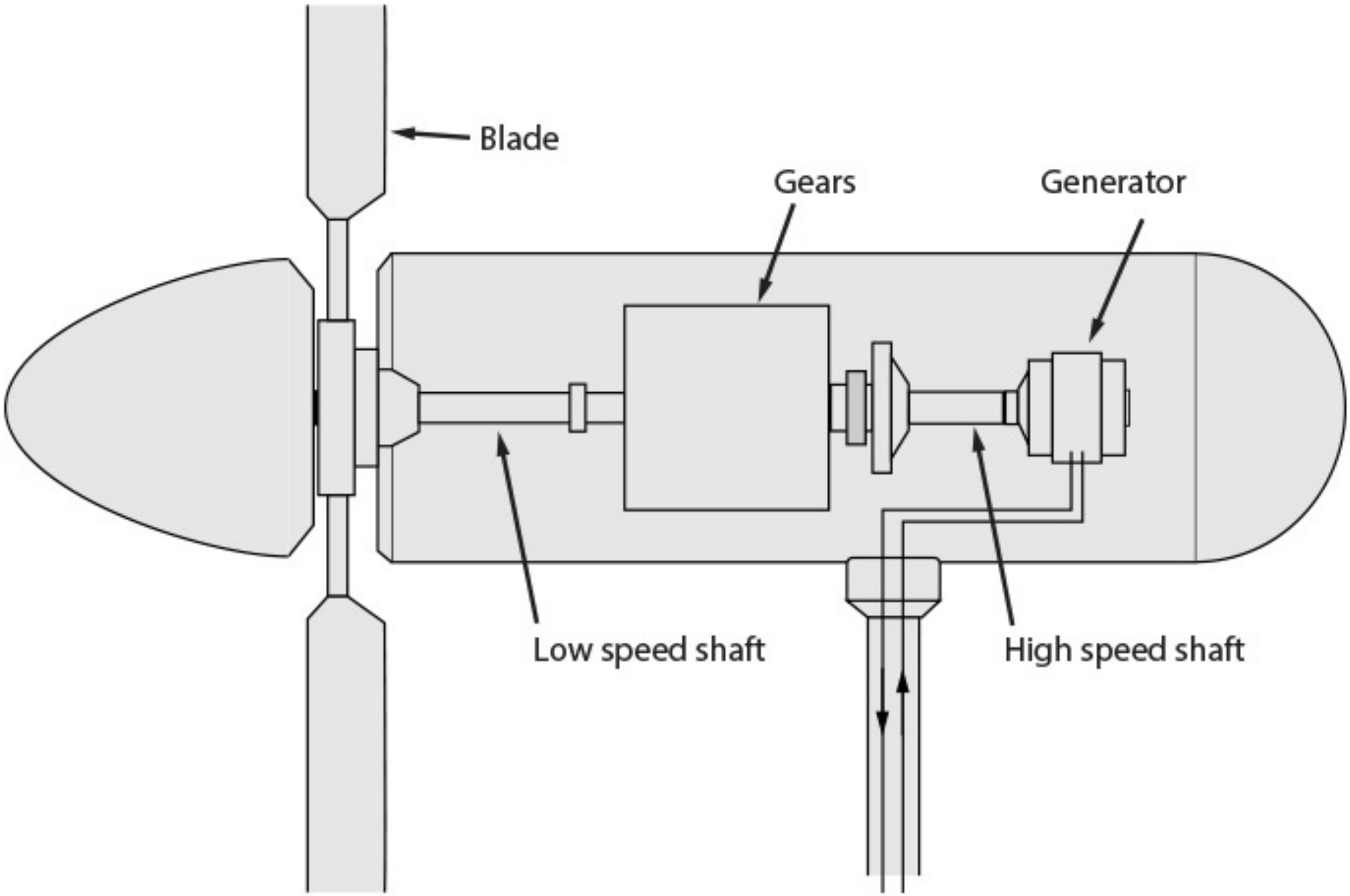
Flowing water pressure
turns Turbine which turns Generator.

Geothermal



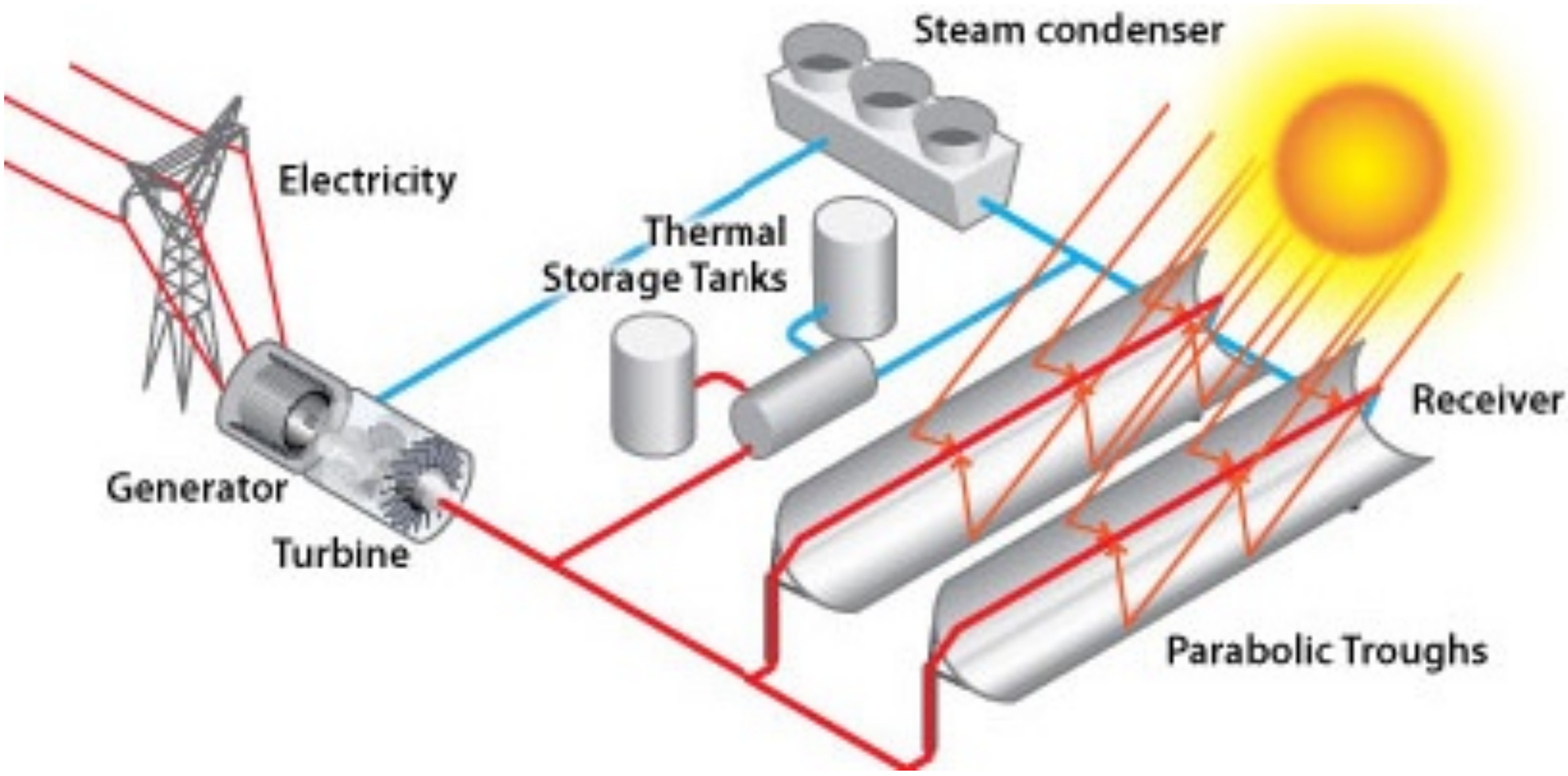
Heat from deep in the earth turns Turbine which turns Generator .

Wind

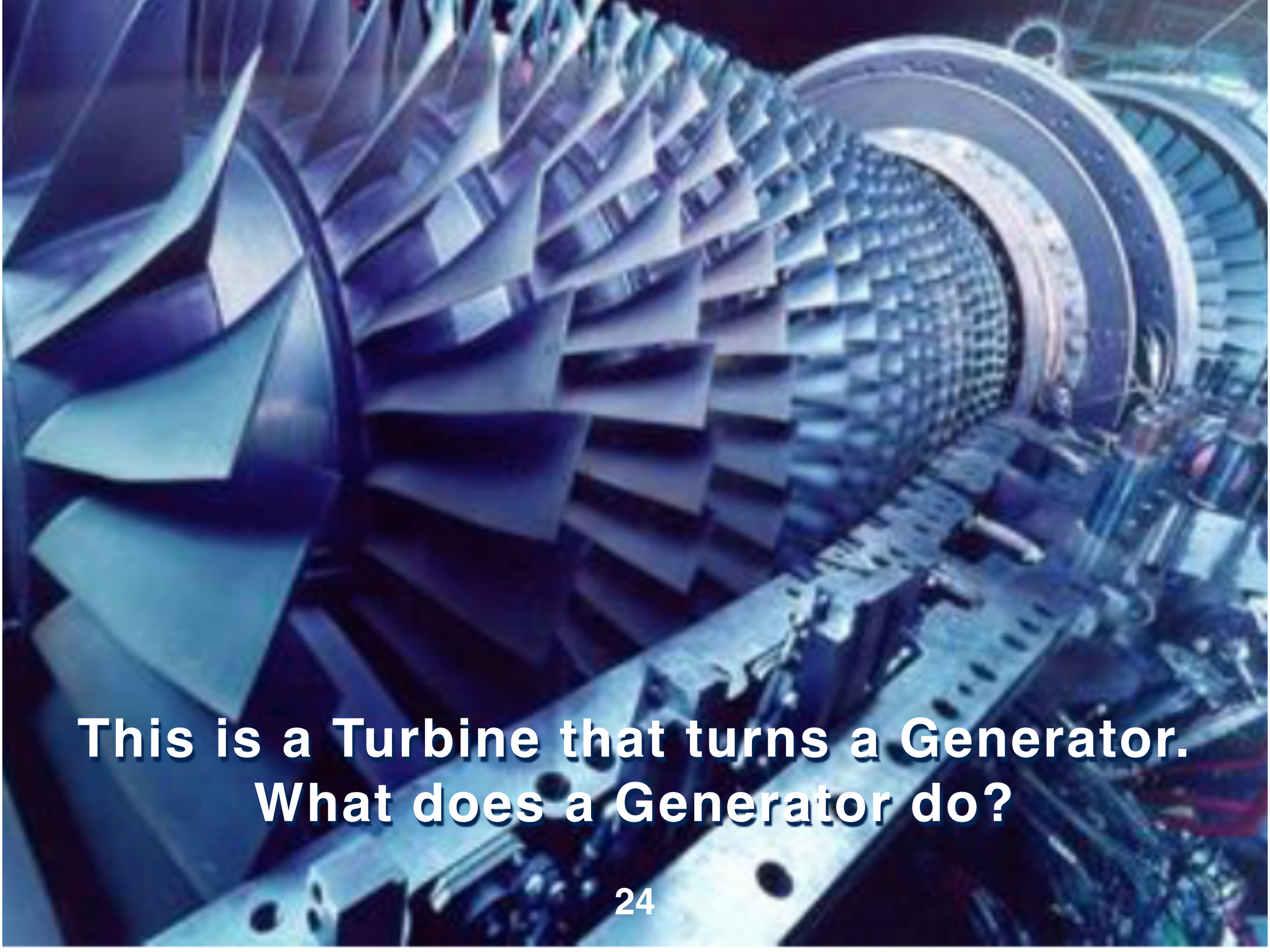


Wind turns Generator

Concentrating Solar Power *It's not PV*

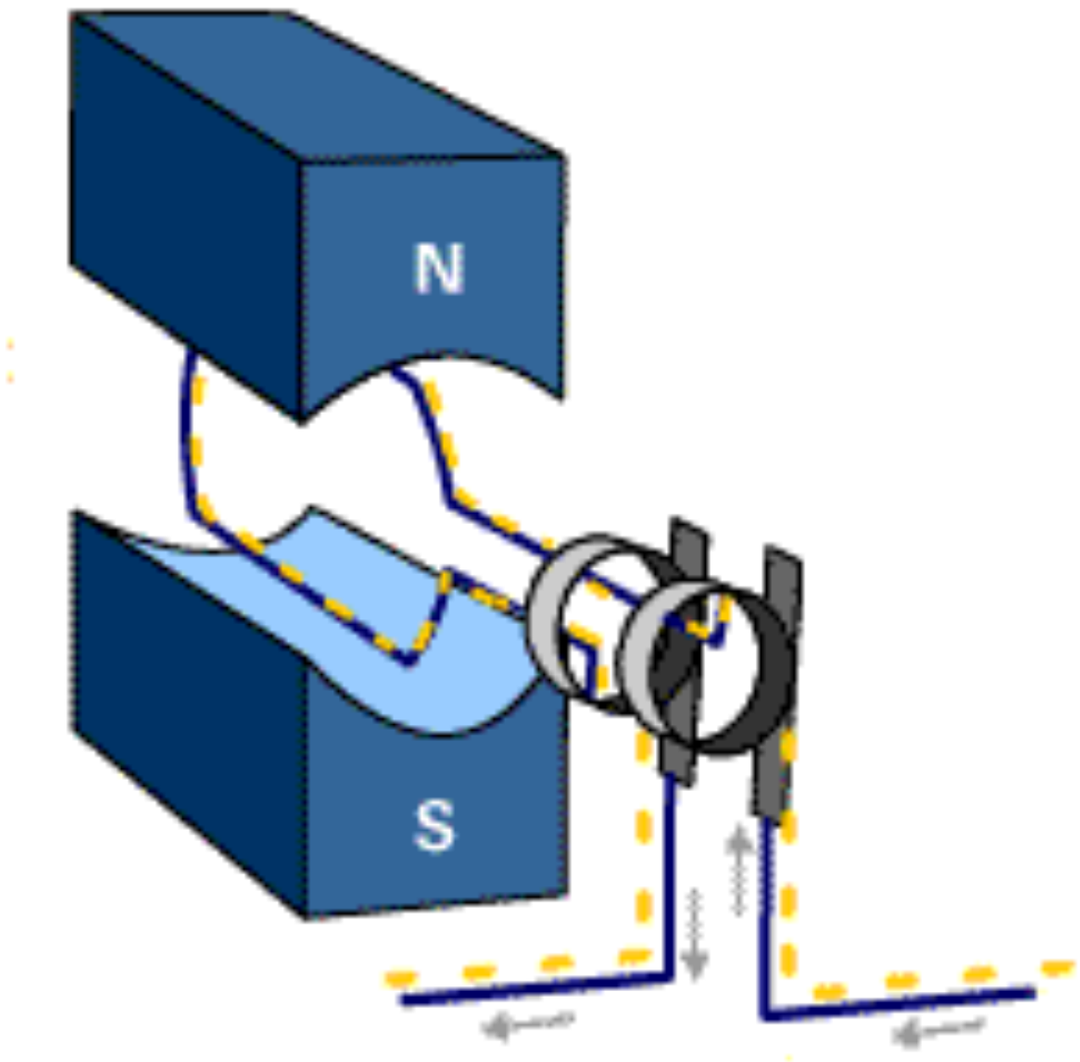


Heat transfer fluid
turns Turbine which turns Generator.



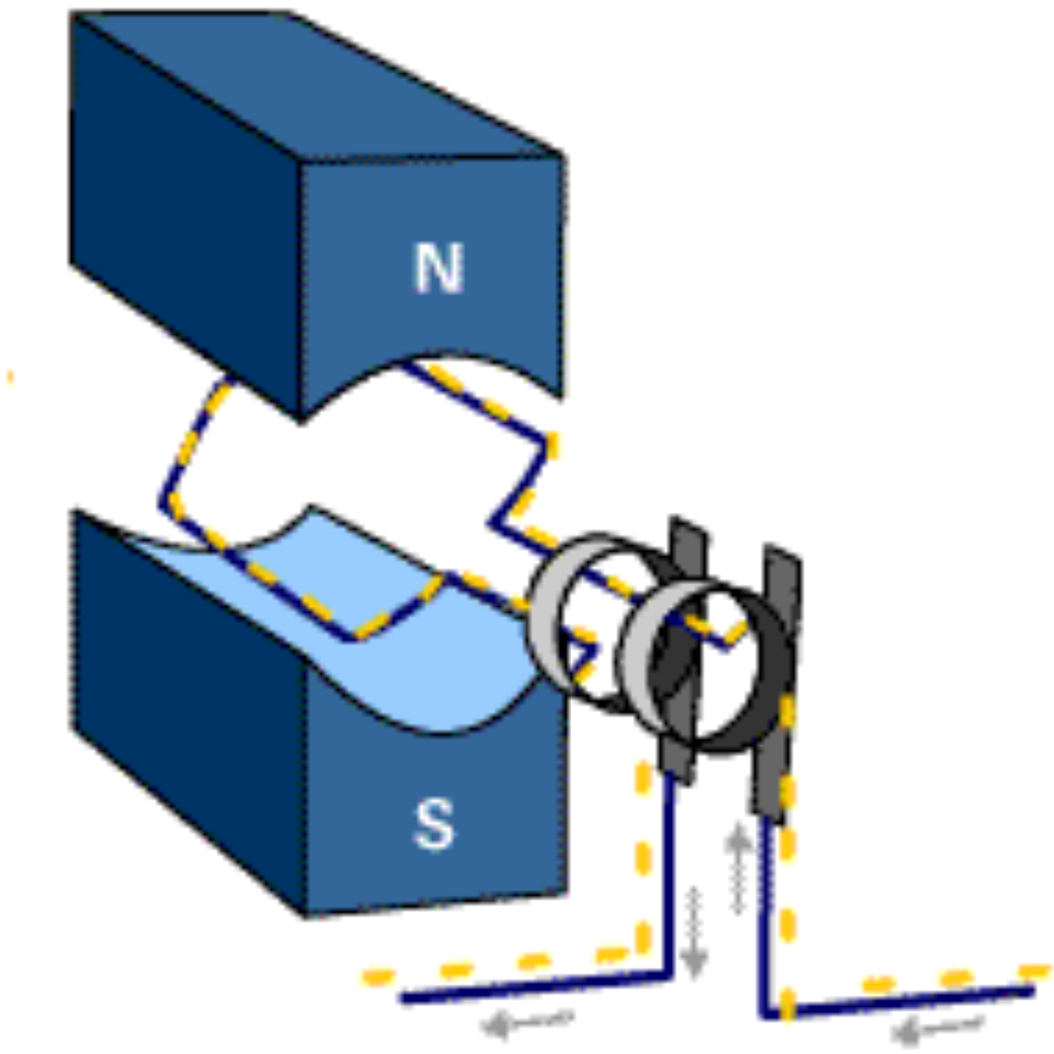
This is a Turbine that turns a Generator.
What does a Generator do?

What is a Generator?



Generators make electricity:
In the US, power plants generate Alternating Current, AC.

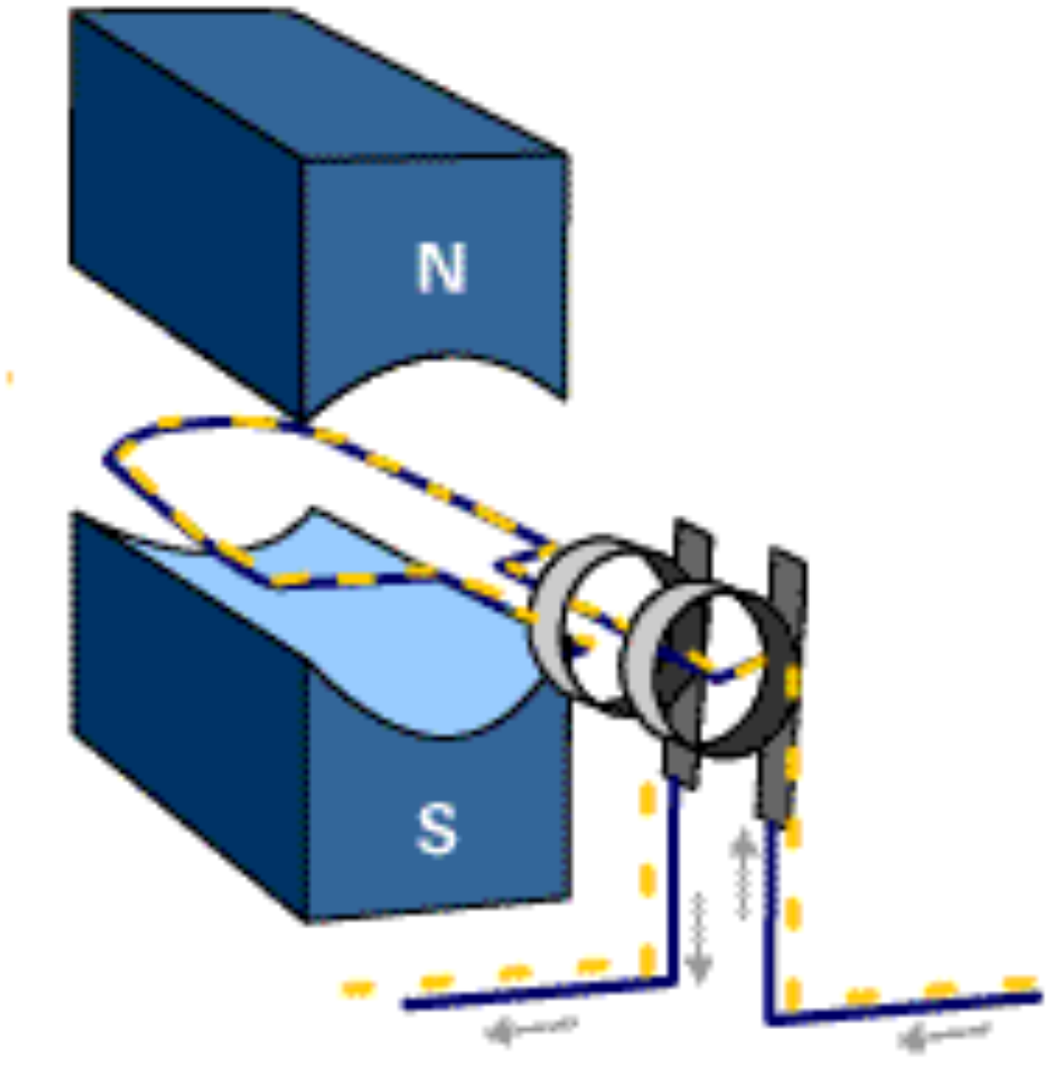
AC can be transmitted safely on transmission lines over long distances
at high voltage.



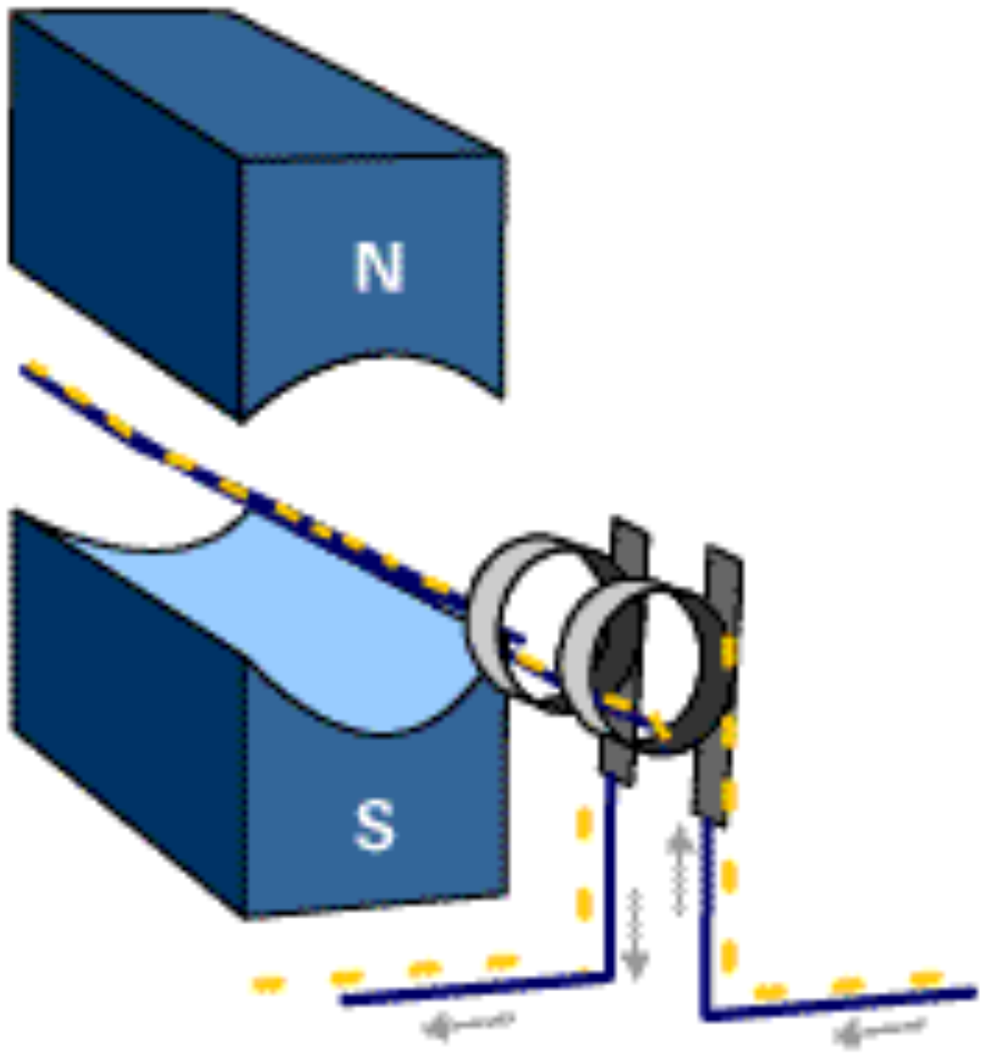
The purpose of a Generator is to convert motion into electricity.

This wouldn't be possible if it wasn't for one fact:

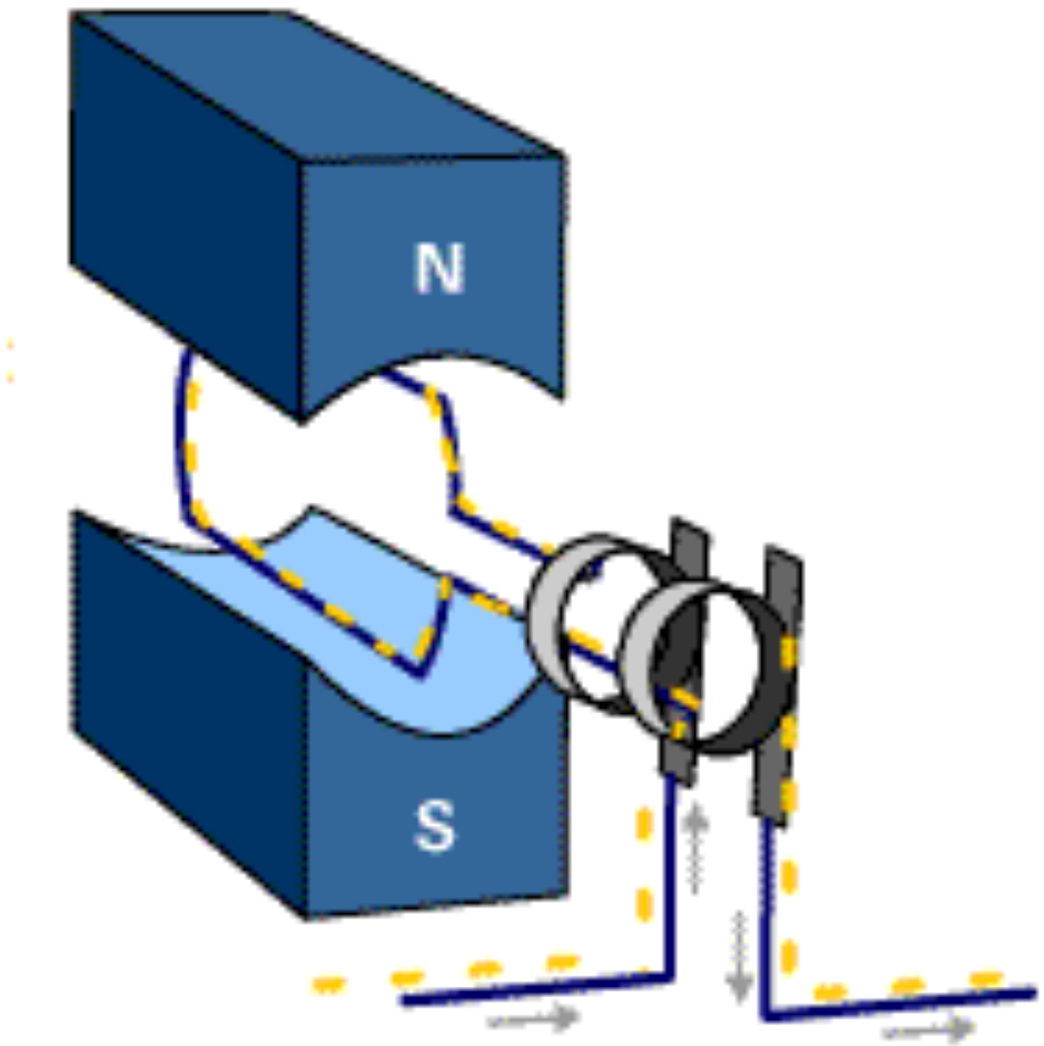
A wire passing through a magnetic field causes electrons in that wire to move together in one direction.



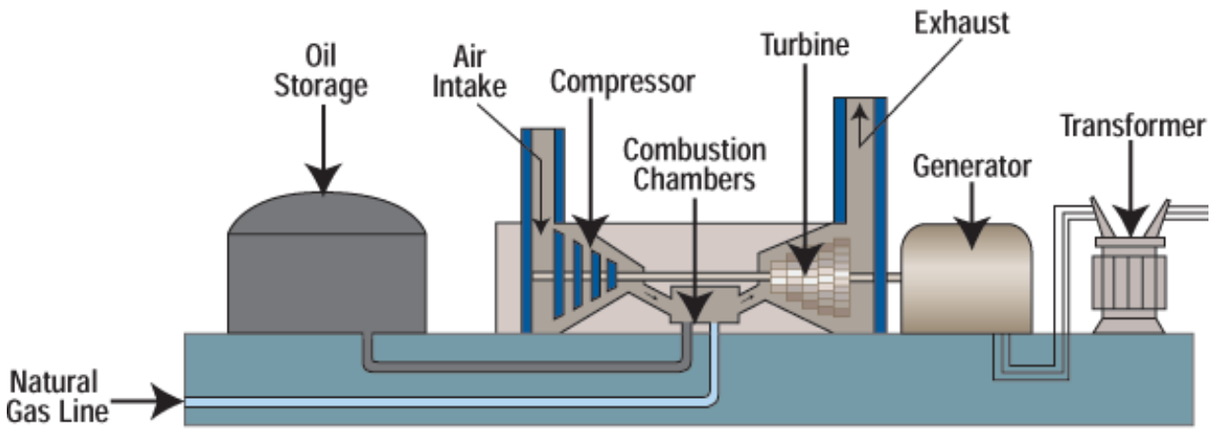
A Generator consists of magnets and an armature. An armature is any number of conductive wires, wound in loops, that rotate through a magnetic field. For simplicity, one loop is shown.

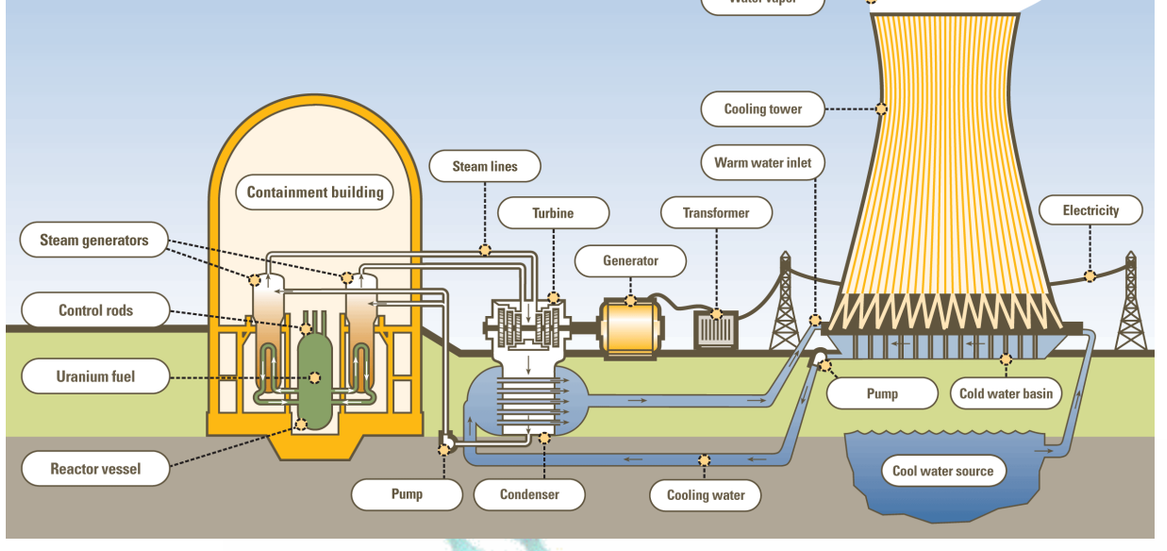


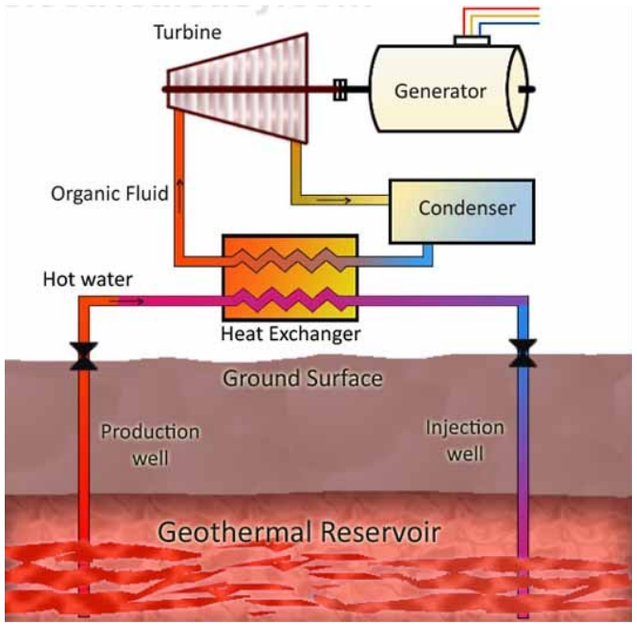
A turbine moves the wire or armature through the magnetic field created by the magnets.



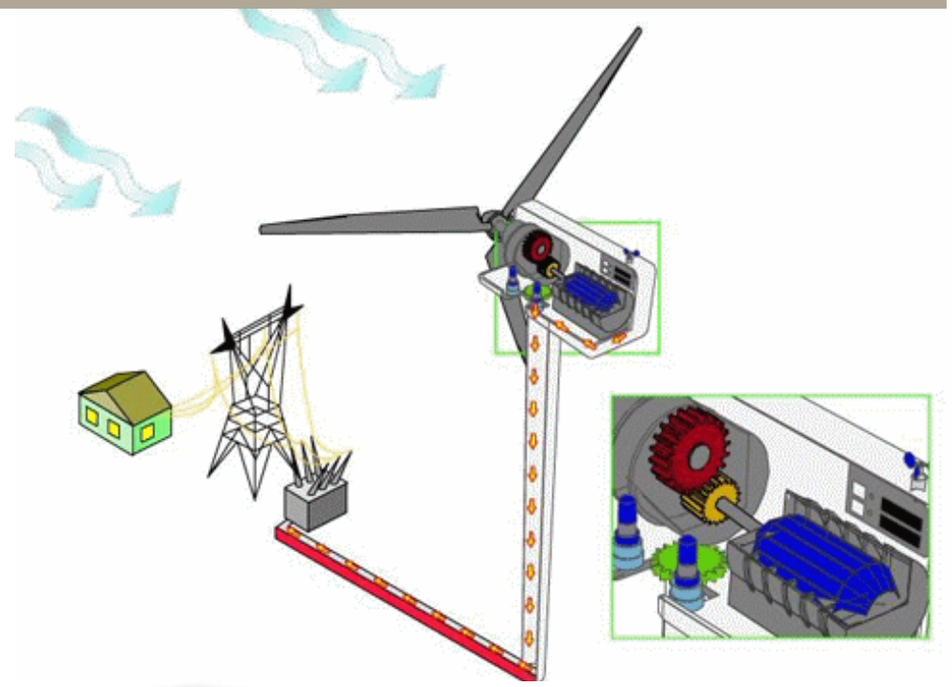
The loop is spinning,
moving across the field
first past one magnetic pole
and then the other,
which means that
the flow of electrons
keeps changing.
Because the electrons
change direction
Alternating Current,
AC results.

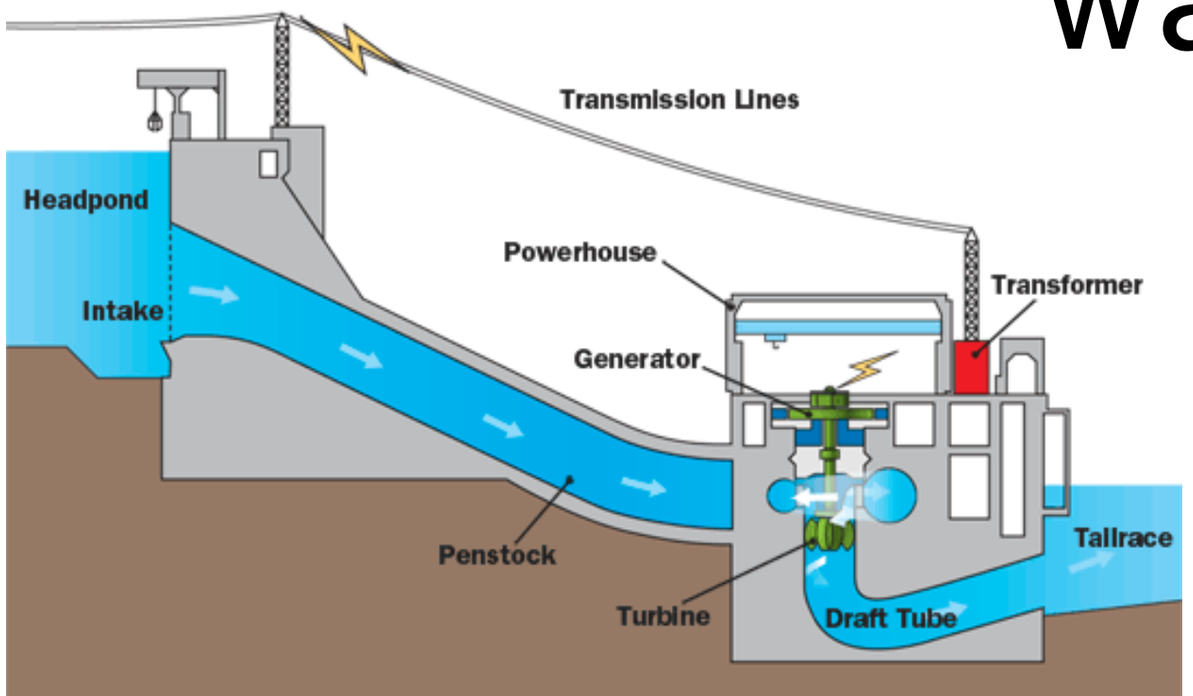


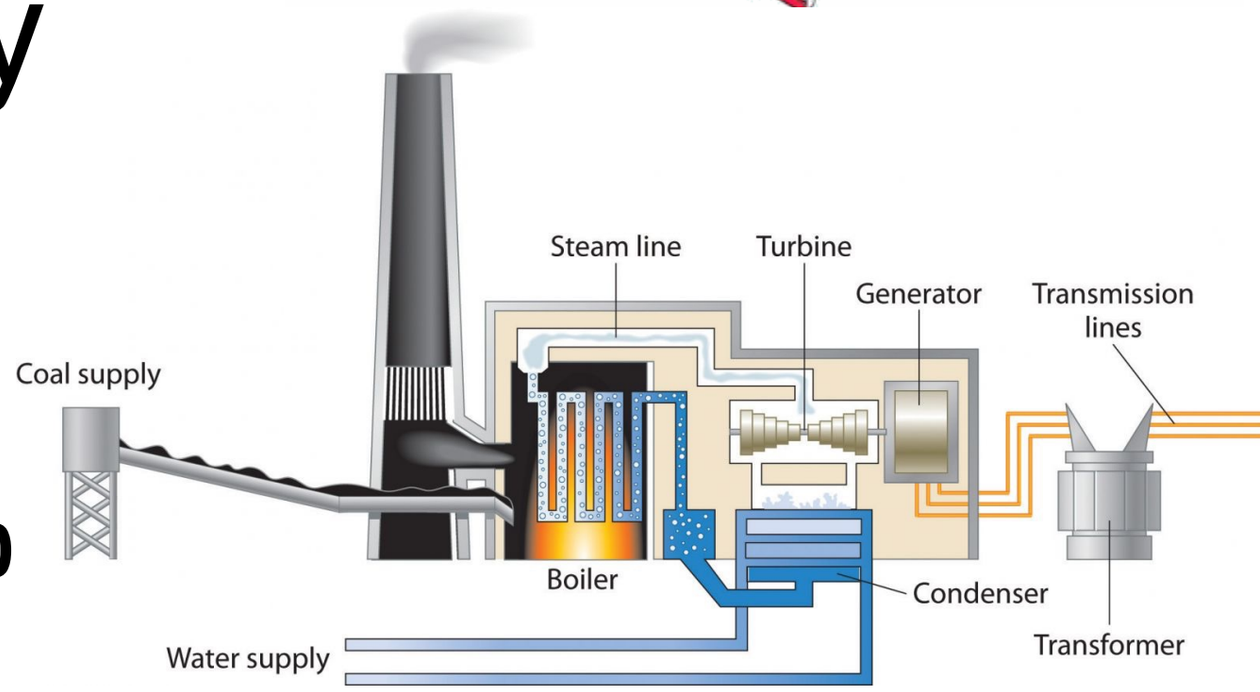




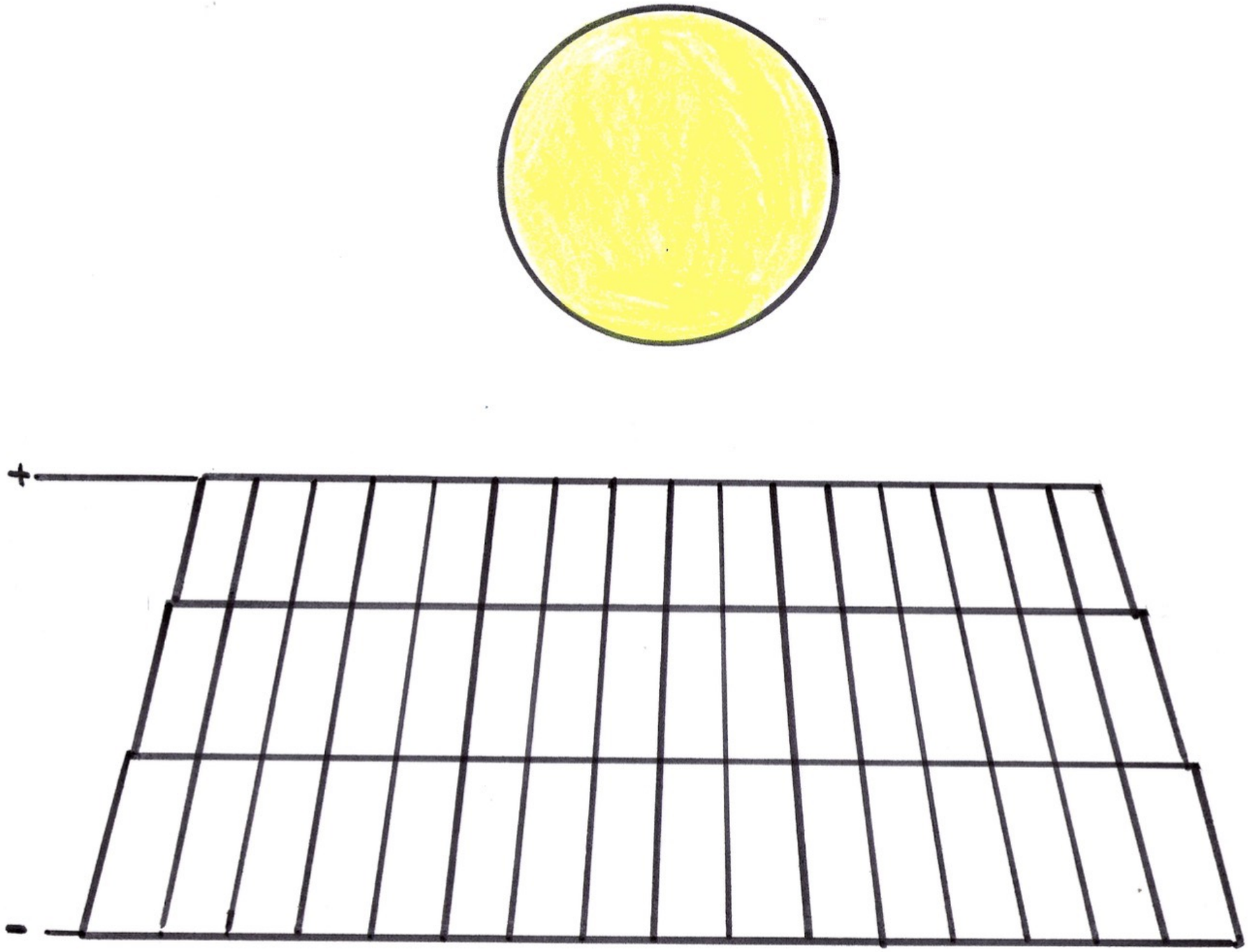
They all work the same way







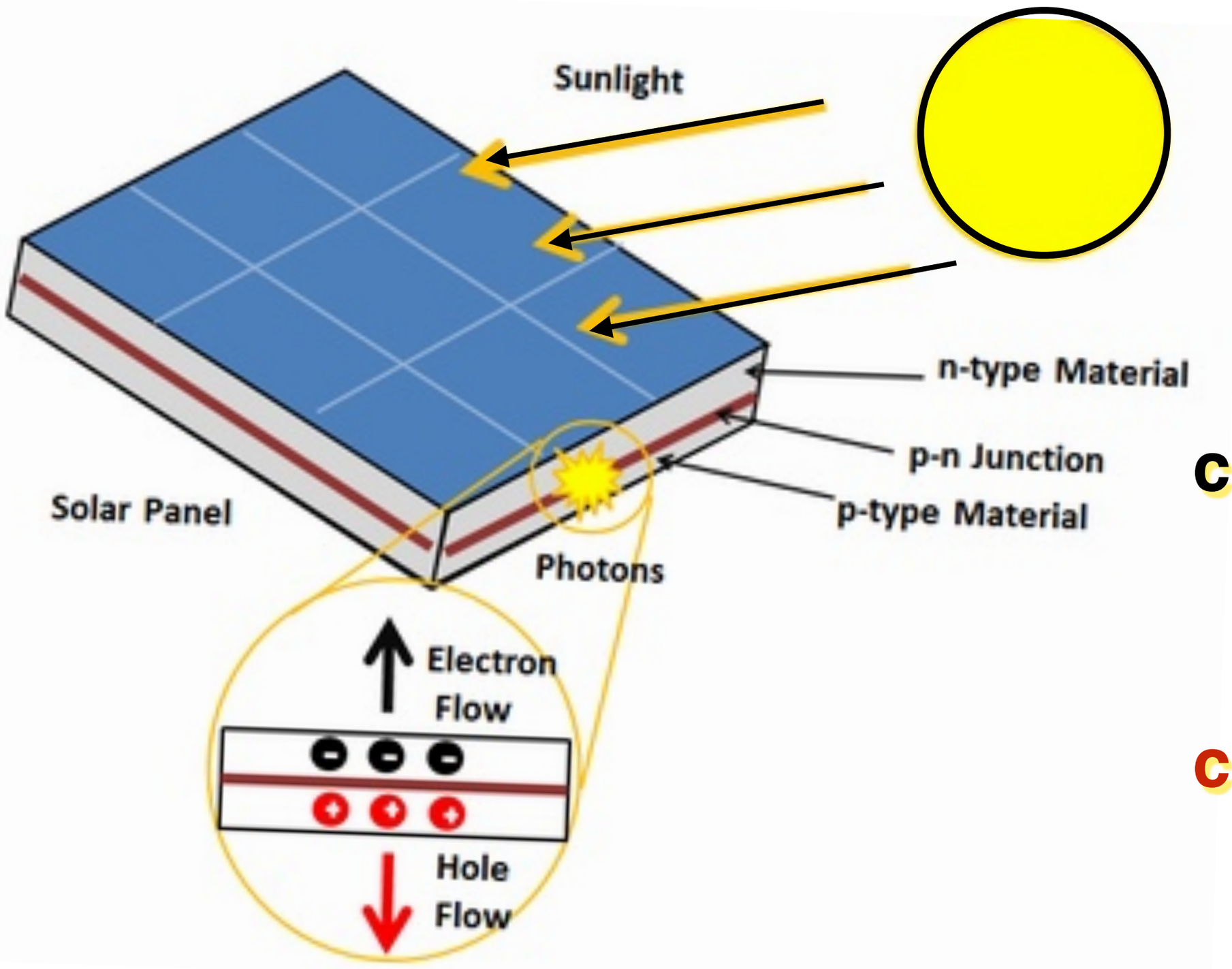
Are you ready for solar?



Solar cells do not use a generator.

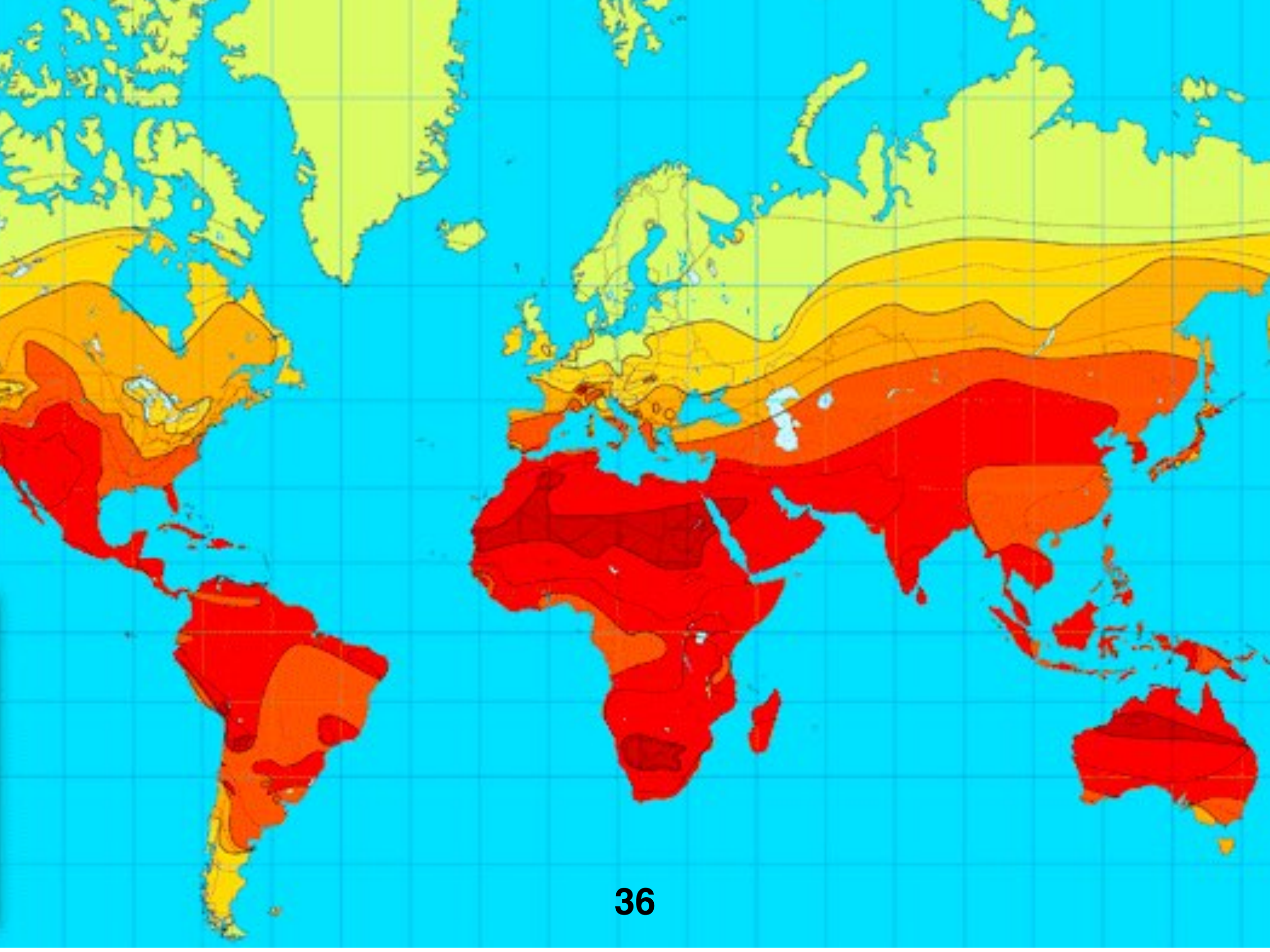
They are the generator.

The photovoltaic effect

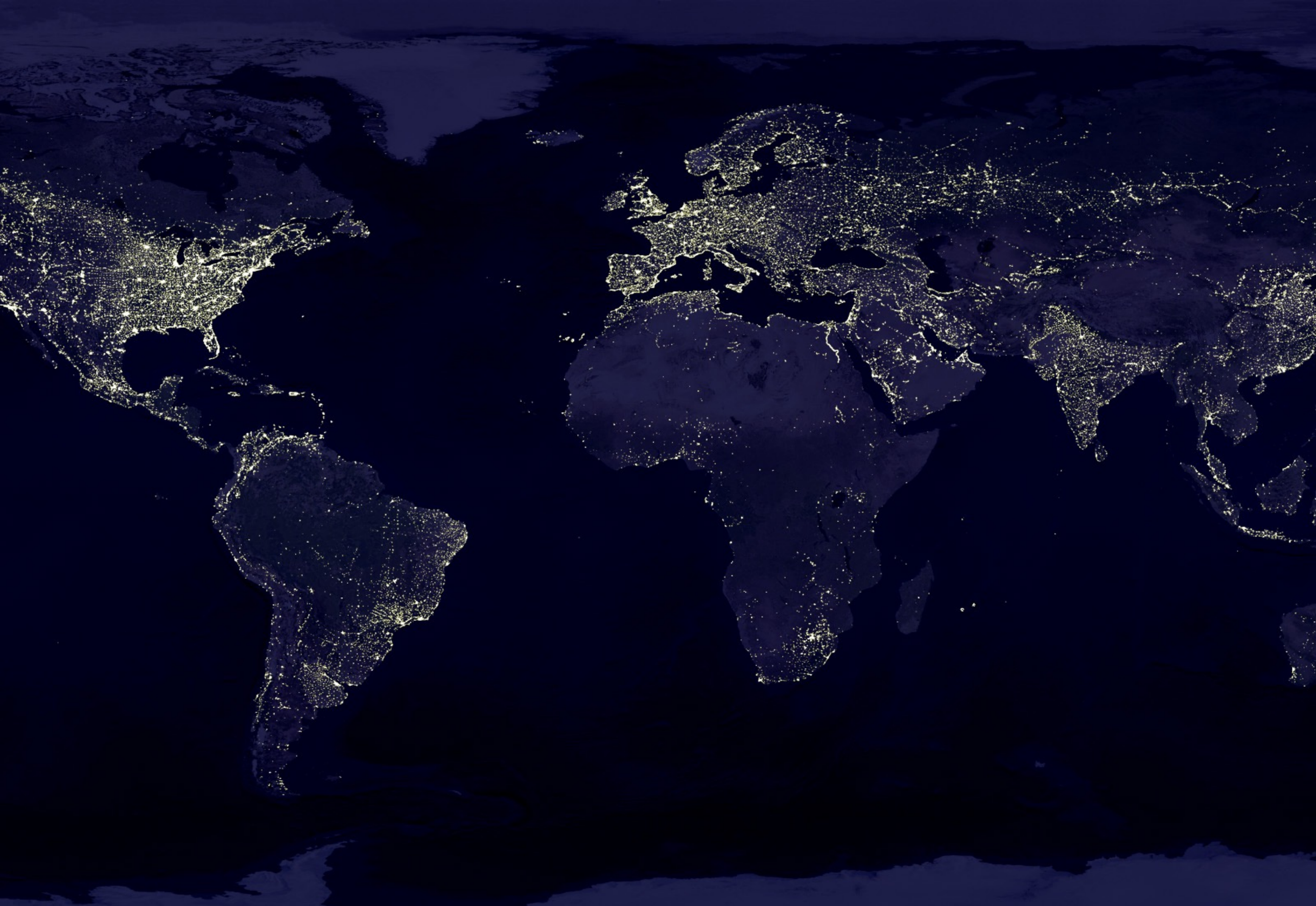


Sunlight causes electrons to flow from **negatively charged silicon** to **positively charged silicon** creating Direct Current, DC,in a circuit.

Where there is Sun...



Where there is need...



GALLUP SOLAR!

Gallup Solar Teams


Hy-Line

photo by Blaine Nez Solar Team 1

Terms for Discussion

Fossil Fuels
Greenhouse Gases
Carbon
Hydrogen
Coal
Natural Gas
Generator
Steam
Turbine
Methane
Nuclear

Radioactive Spill
Renewable Energy
Hydroelectric
Geothermal
Concentrating Solar Power
Transmission Lines
Alternating Current
Photovoltaic
Positive
Negative
Direct Current

until we meet again