

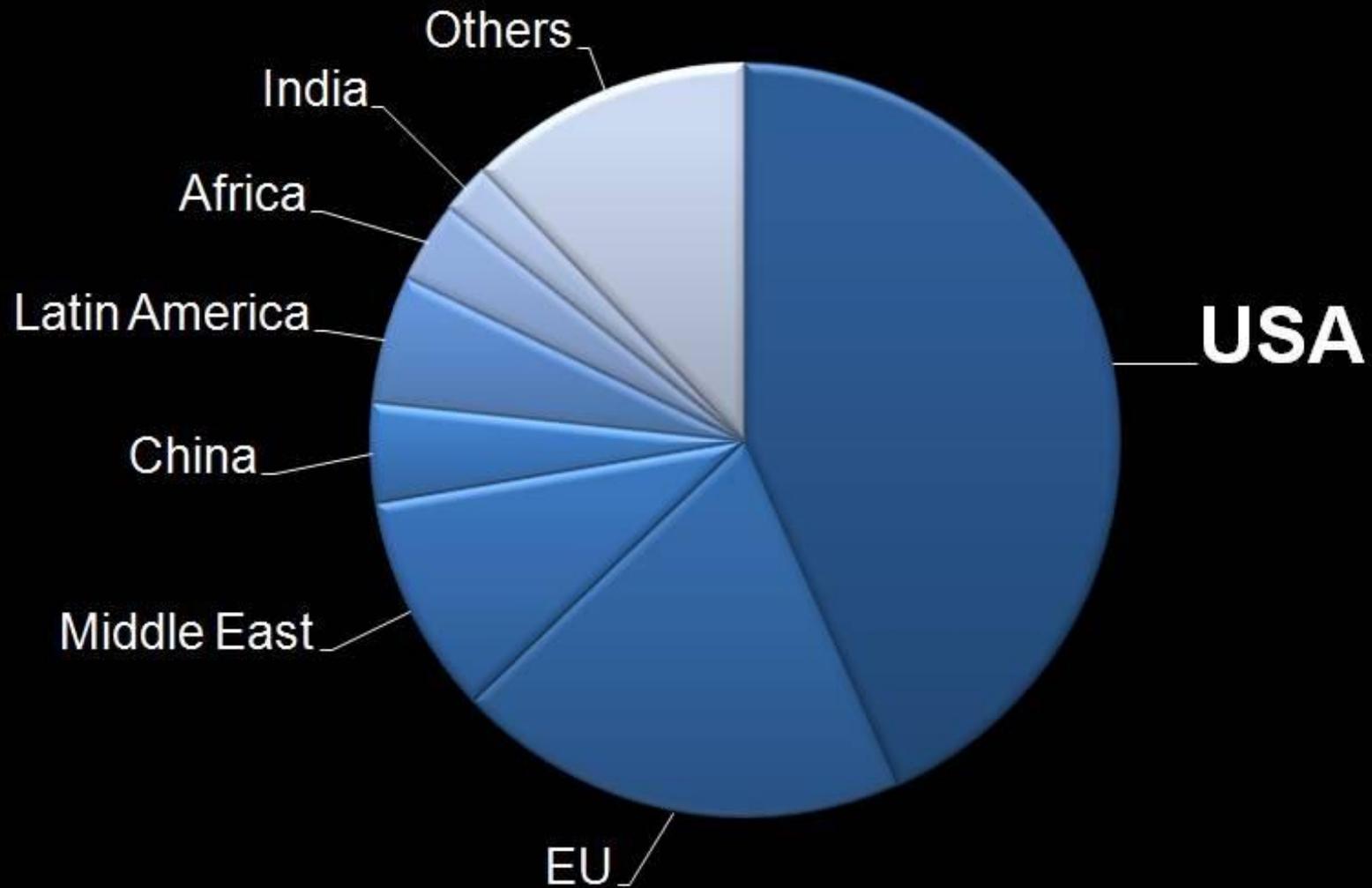


I've Got the Power!

Types of Energy and how it affects our lives.



Global Per Capita Energy Use



Categories

Energy is broken down into 2 categories...

RENEWABLE

And

NON-RENEWABLE

RENEWABLE

Energy that comes from a source that can be replenished (replaced) within our life time.



Renewable Examples:

 **SOLAR**

 **WIND**

 **HYDROELECTRIC**

 **GEO THERMAL**

 **BIOENERGY (BIOMASS)**

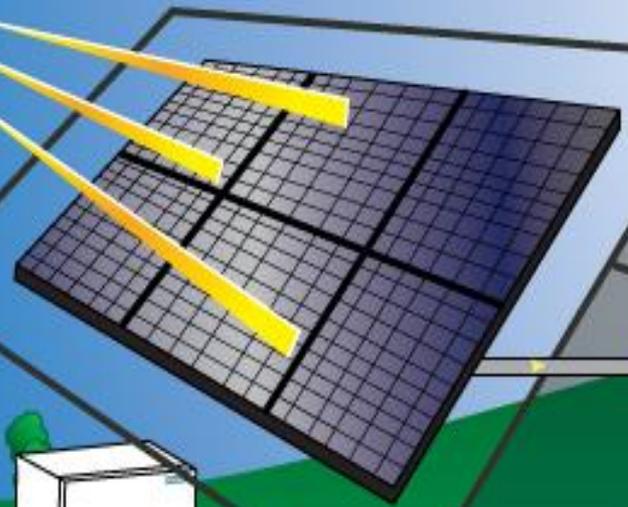
SOLAR

- ❁ **The energy that we capture directly from the sun through the use of solar panels.**
- ❁ **Can be used to heat homes, generate electricity, hot water, heating, and commercial/ industrial uses.**
- ❁ **Problems: Cloudy days, not always pointing at the sun, expensive, uses lots of land that could be used for farming.**



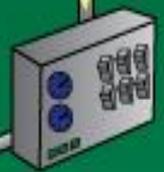
1

Solar panels convert the sun's energy into electricity.



2

A control device changes this electricity, enabling it to power electrical items.



3

The electricity then passes through a breaker box to outlets in the building.

4

Items such as a refrigerator and lamp can plug into the outlets for power.



WIND

- ❁ **Energy collected from the wind moving a turbine connected to a generator.**
- ❁ **This energy is indirectly caused by the Sun, because the sun is responsible for making the wind.**
- ❁ **Problems: Wind isn't always blowing, loud, kills birds.**



HYDROELECTRIC

❁ **Flowing/ Falling water creates energy that can be captured and turned into electricity. This is called hydroelectric power or hydropower.**

❁ **Hydroelectric power generates 10 percent of our nations energy.**



HYDROELECTRIC

- ❁ **Problems: Expensive to build.**
- ❁ **Creates a reservoir that floods the natural land around it.**
- ❁ **Stops migrating animals like salmon.**



GEO THERMAL



❁ Geothermal energy is the heat from the Earth. Geo means Earth and Thermal means heat.

❁ This energy can come from the escape of steam from a hot spring or other hot water sources provided by our planet.

❁ This energy is created by the Earth's core where temperatures are **MUCH** hotter.

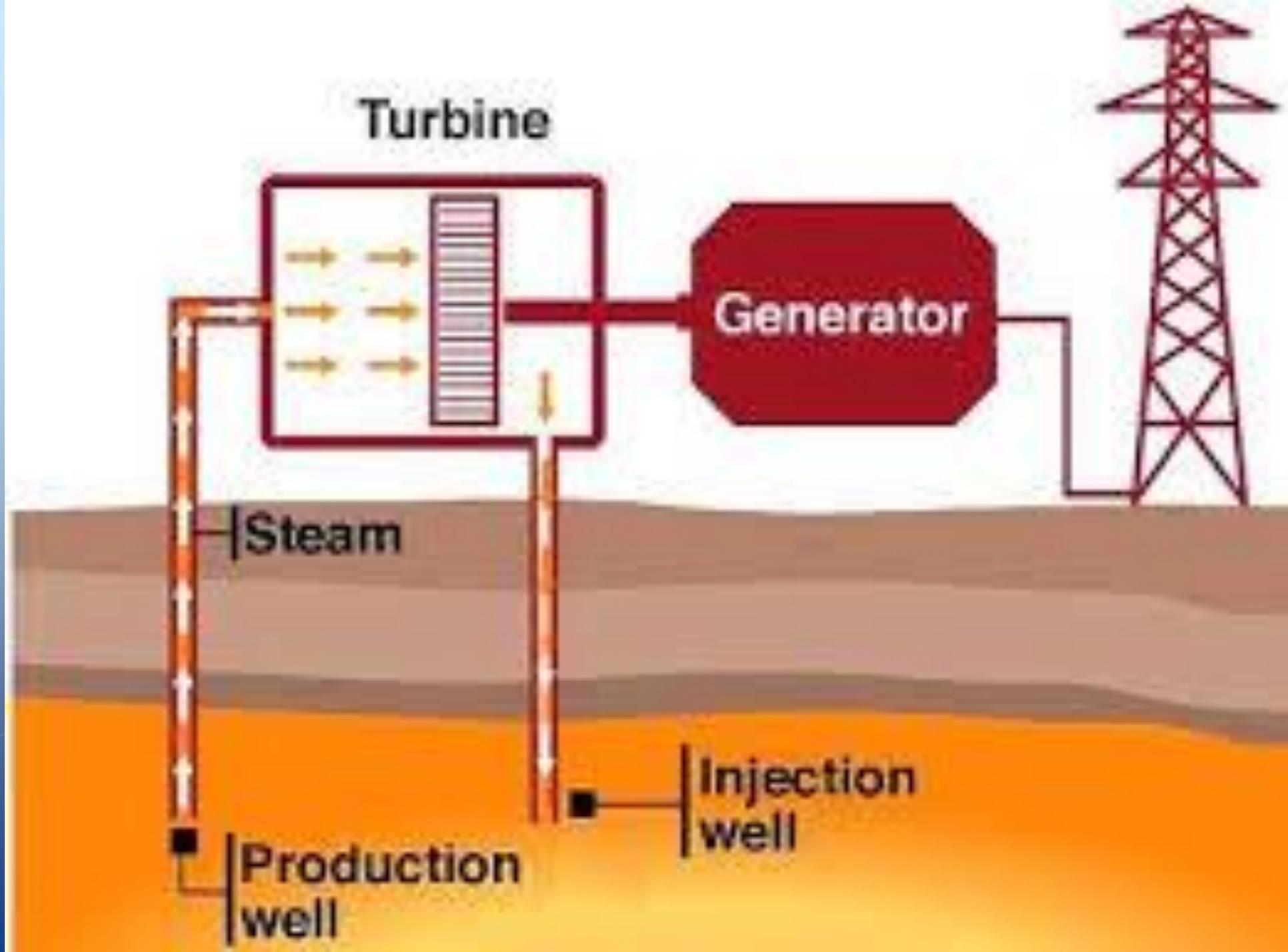


GEOHERMAL



- ❁ **Problems: Hot spots can move or become “cold” making the geothermal station unable to be used.**
- ❁ **Few locations are suitable for this type of energy.**

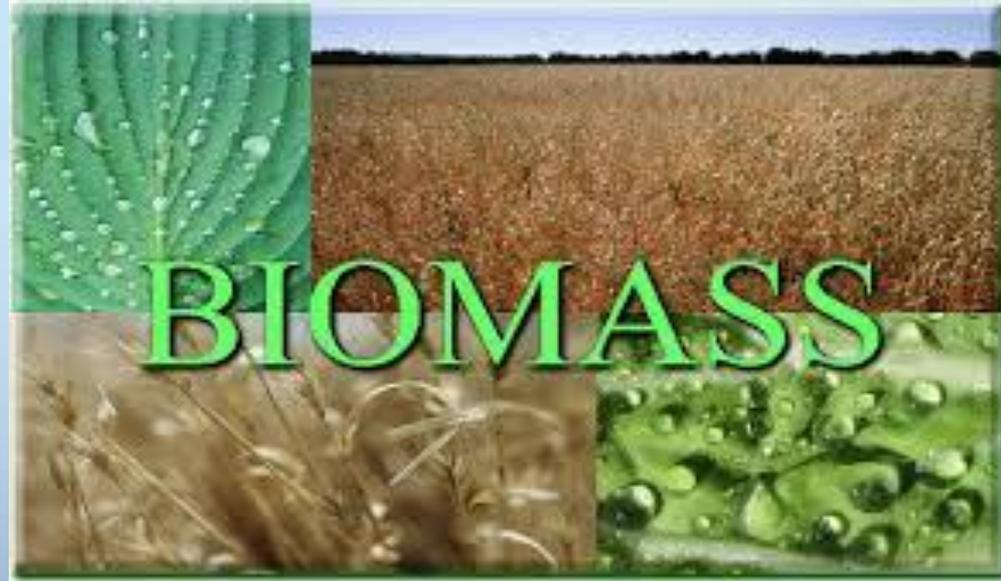




BIOMASS

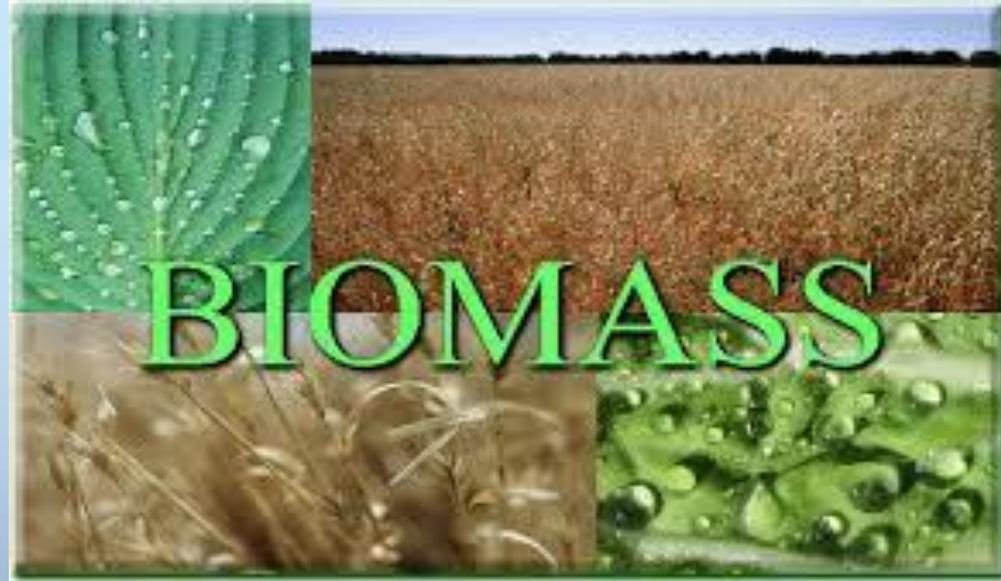
⚙️ The energy of organic living matter. This can come from things like

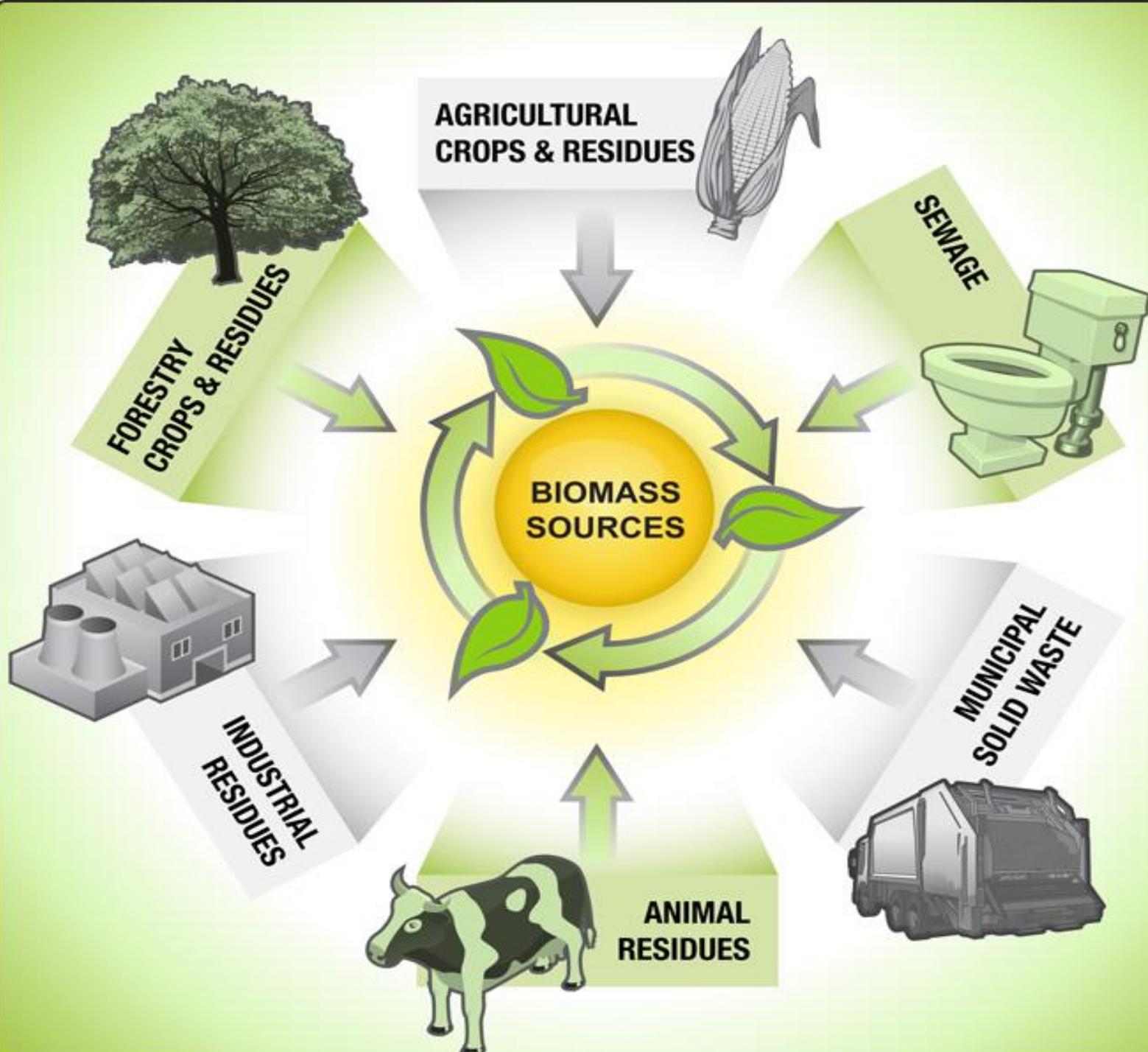
- 🌸 Wood (our biggest source)
- 🌸 Plants
- 🌸 Fumes from organic compounds in landfills



BIOMASS

- ❁ Problems: The land used to grow biocrops could be used to grow crops for eating.
- ❁ Expensive processes and needs specialized equipment to use the fuel produced.

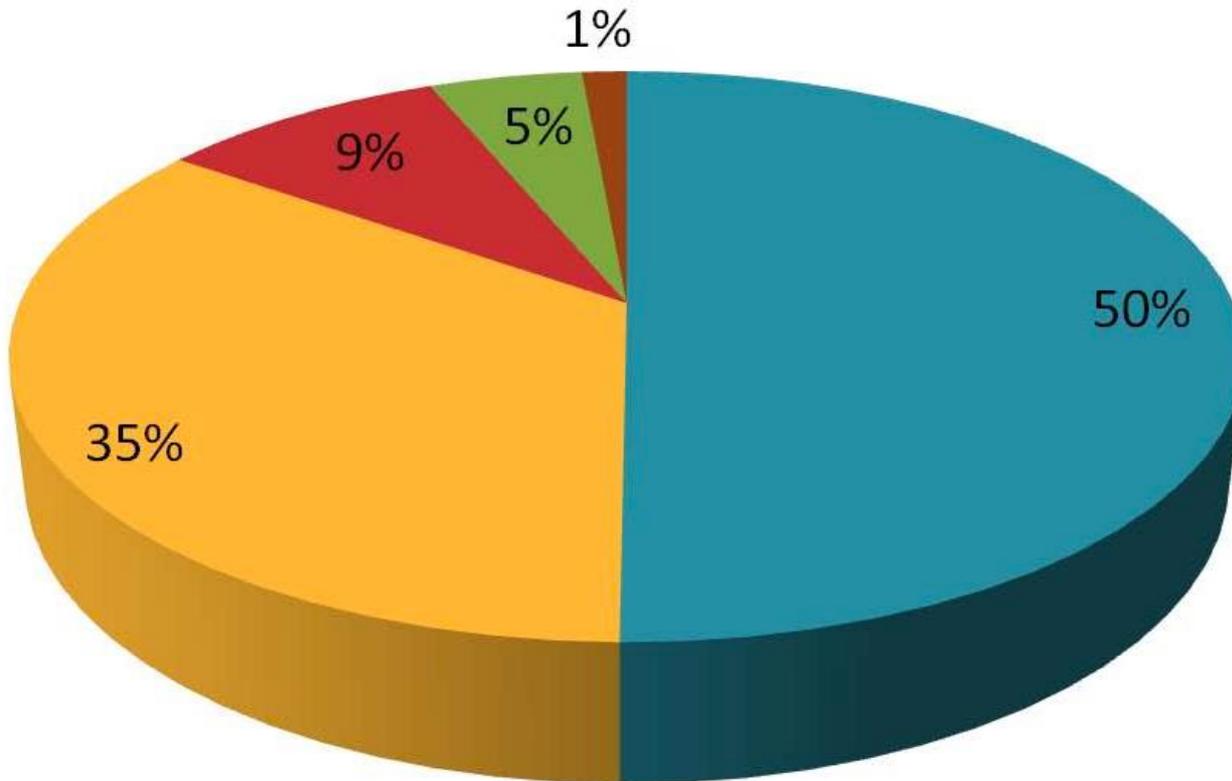




Renewable Energy in the US:

Renewables

■ biomass ■ hydro ■ wind ■ geothermal ■ solar and PV



NON-RENEWABLE

**Sources of energy that will
run out or will not be
replenished for thousands or
even millions of years!**

NONRENEWABLE EXAMPLES:

Fossil Fuels

 Coal

 Oil

 Natural Gas

 Nuclear

FOSSIL FUELS

❁ Fossil fuels

❁ Created after living things (such as plants) die

❁ Buried in layers of dirt.

❁ After millions of years and pressure, they turn into OIL, COAL, and NATURAL GAS.

❁ Give off a lot of carbon dioxide when burned, adding to global warming.

❁ Once they're gone, they're gone.

Coal

- ❁ Obtained mainly through
 - ❁ Mining and mountain top removal (blowing up chunks of mountain to get to the coal within)
- ❁ Burned for energy
- ❁ Problems: destroys the environment
- ❁ Creates greenhouse gasses



Oil



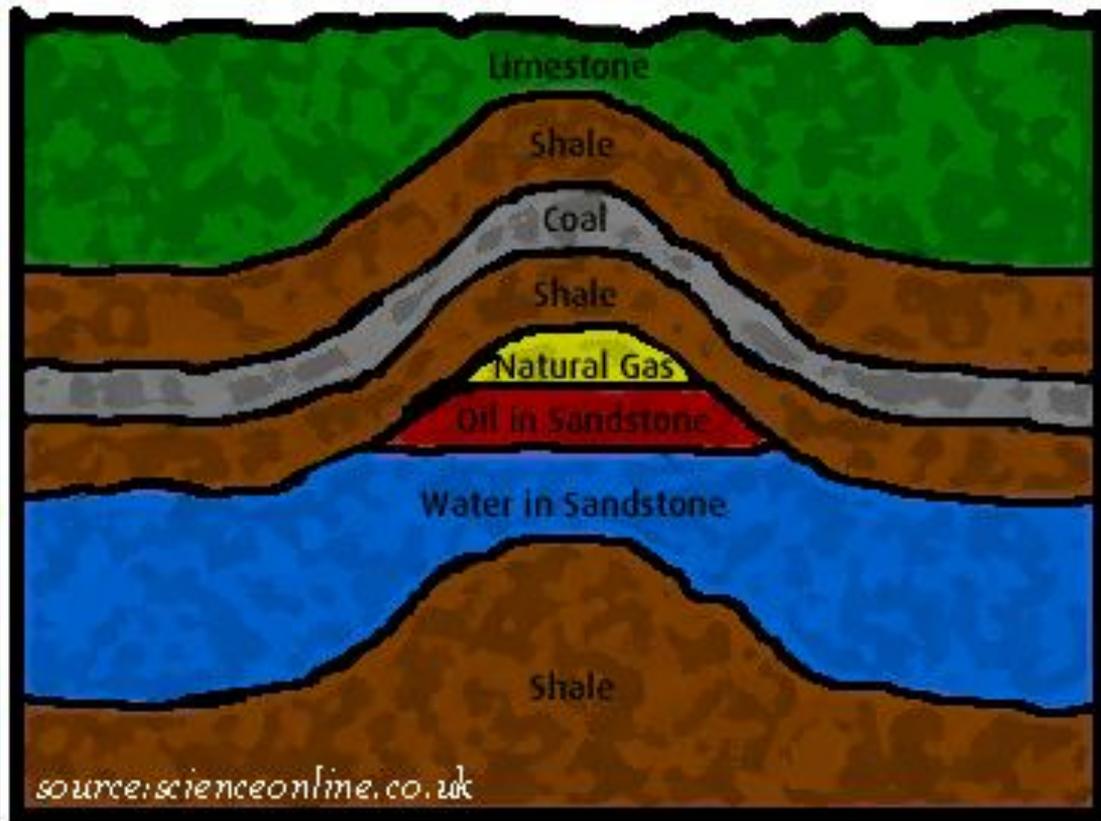
- ❁ Mainly obtained by drilling
- ❁ Problems: When burned, creates greenhouse gasses
- ❁ Oil spills destroy natural habitat and harm wildlife

Natural Gas

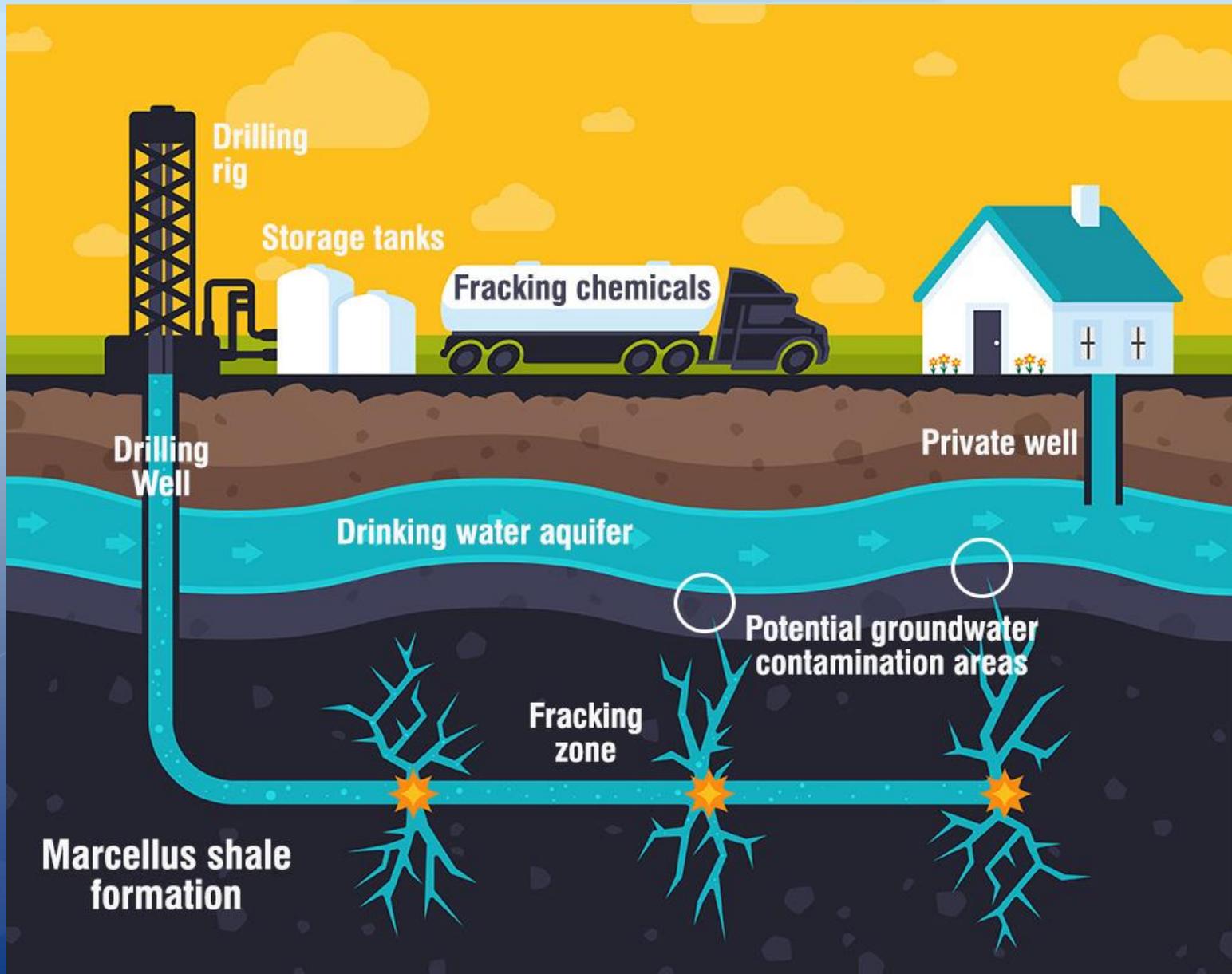
❁ Obtained by (hydro)fracking rock layers

❁ Problems

- ❁ Destroys habitat
- ❁ Minor earthquakes
- ❁ Ground water contamination
- ❁ Greenhouse gasses when burned.



Natural Gas



Nuclear

- ❁ Obtained by mining radioactive elements such as Uranium
- ❁ Problems
 - ❁ Creates radioactive waste that we cannot dispose of safely
 - ❁ Non-sustainable



Nuclear

❁ Problems

- ❁ Nuclear waste can contaminate water and air – also around for LONG periods of time.
- ❁ Nuclear “Melt downs”



Environment Provides Resources

- ❁ All living things use energy from the environment in some way
 - ❁ Renewable
 - ❁ Non-renewable
- ❁ Renewable resources are replaced at least as fast as they are used
 - ❁ Air by plants
 - ❁ Freshwater by water cycle
 - ❁ Soil by other soil (new soil takes a while to form)
 - ❁ Living things by reproduction
 - ❁ Sunlight by nuclear fusion for billions more years

Some Resources are Non-renewable

- ❁ Fossil fuels
 - ❁ Coal, oil, natural gas
- ❁ Minerals
 - ❁ Diamonds, metals, etc.



Depletion of Energy Resources

❁ Deplete (depleting, depleted, depletion)

❁ To cause to be less, to use up

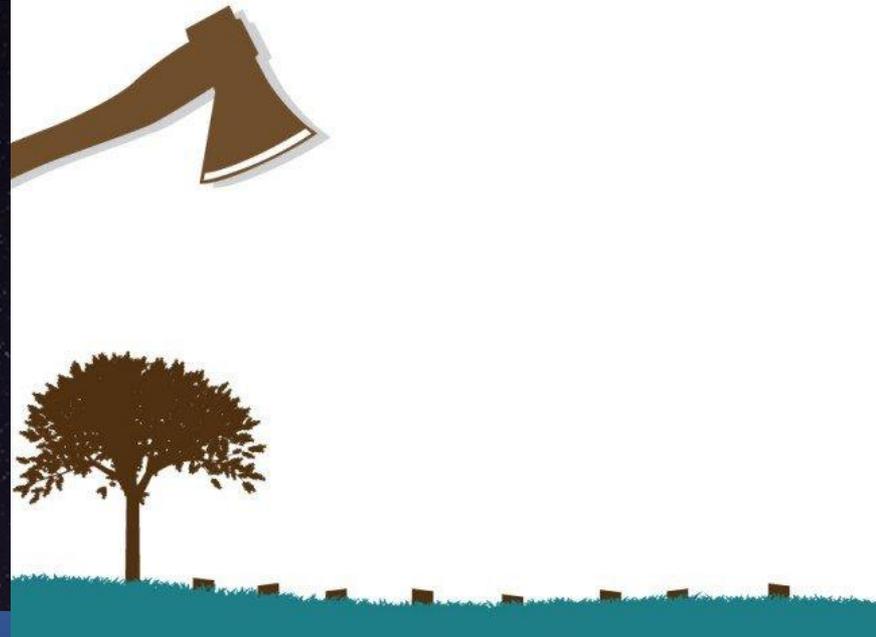


IS THE BATTERY HALF CHARGED



50% Charged

OR HALF DEPLETED?



Depletion of Energy Resources

- ❁ Conserve (conserving, conserved, conservation)
- ❁ To be mindful of how we use something, take care of it, manage it so it lasts as long as possible, not be wasteful.



c o n s e r v e



Depletion of Energy Resources

❁ Conservation

- ❁ Necessary for non-renewable resources
- ❁ Recommended for renewable resources



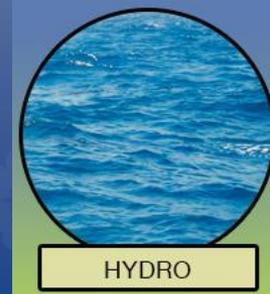
BIOENERGY



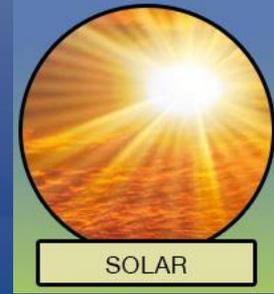
GEOTHERMAL



WIND



HYDRO



SOLAR