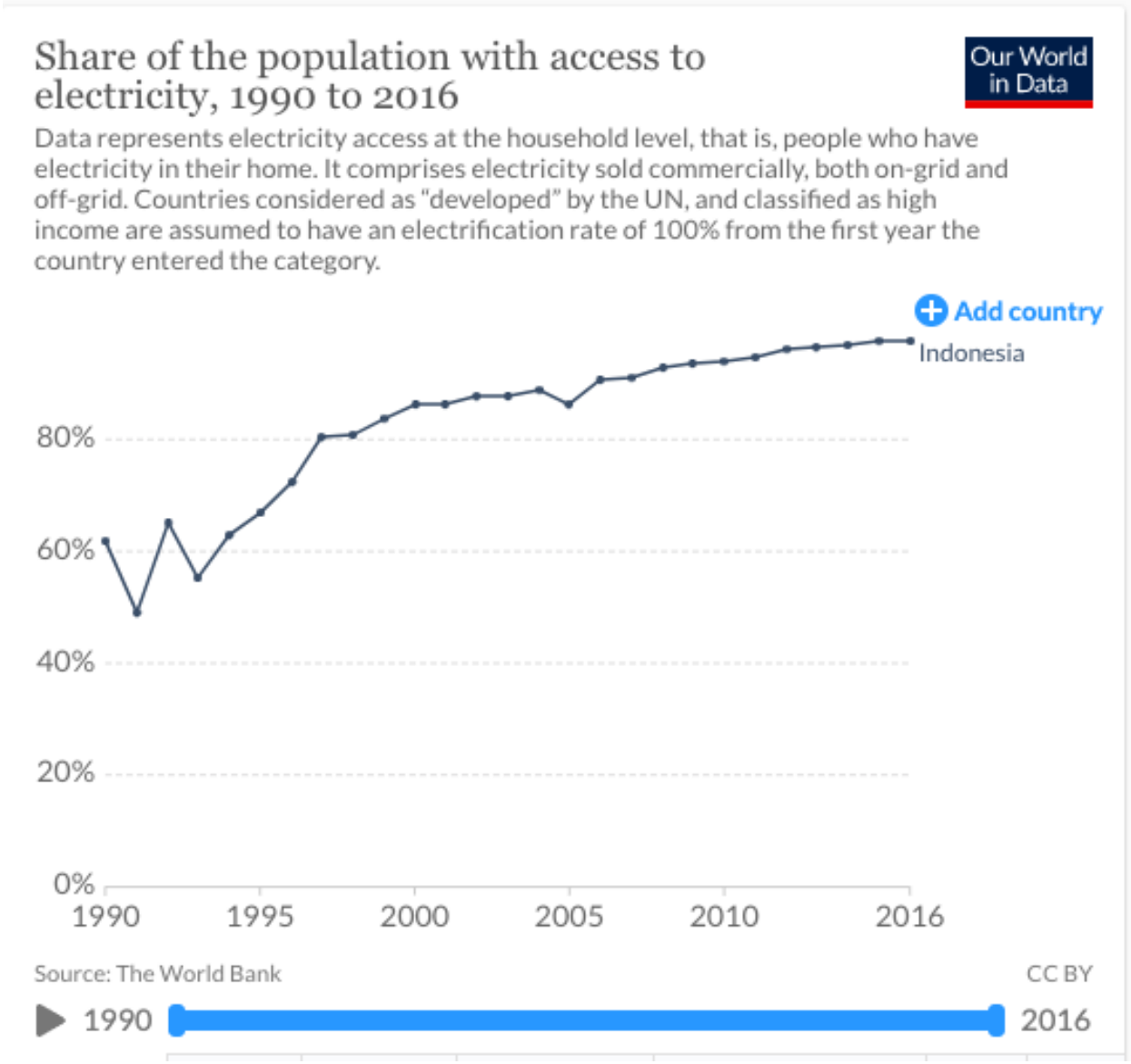
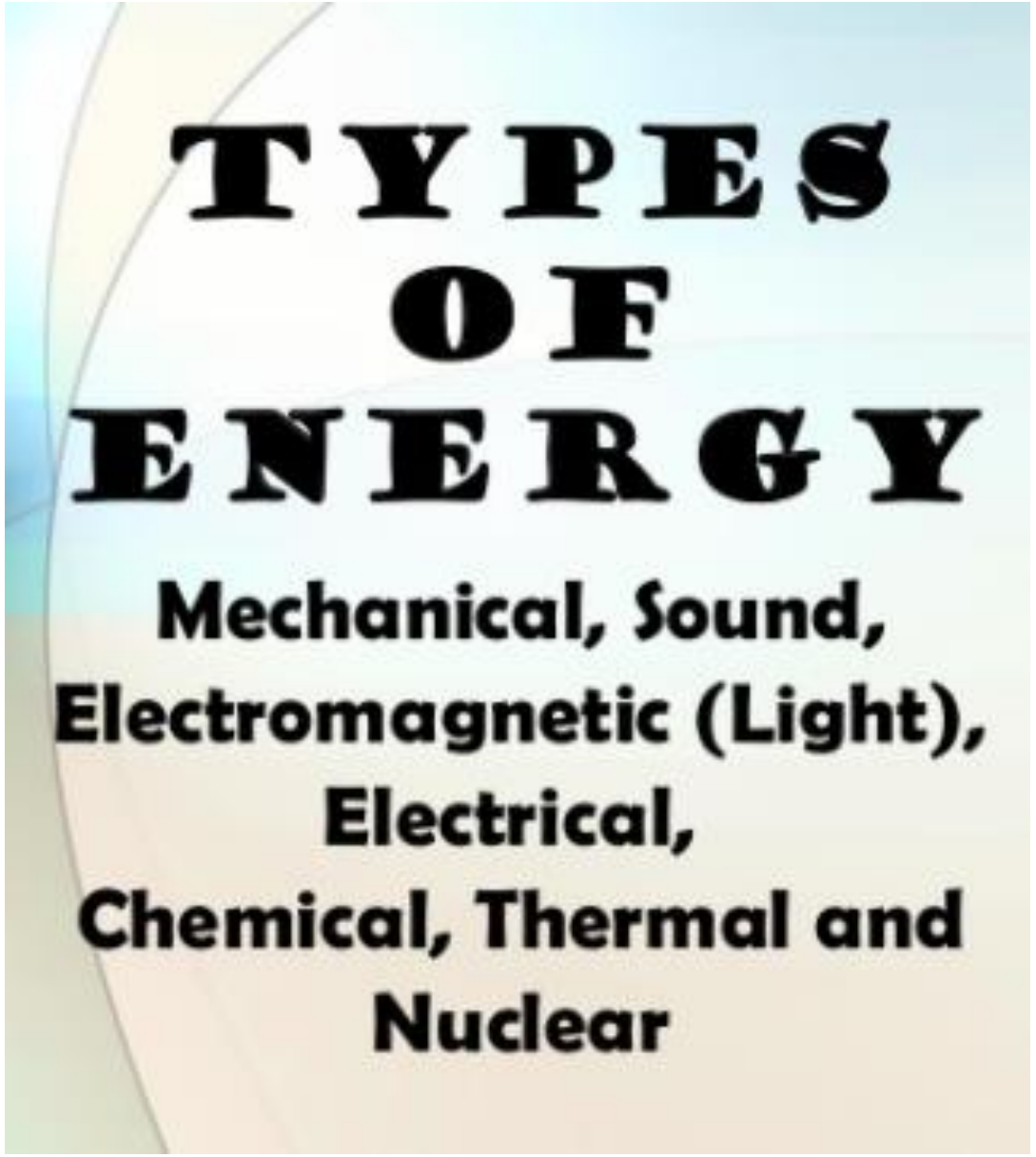
PEMBANGUNAN BERKELANJUTAN

Pertemuan 12 – Energi & Energi Baru Terbarukan

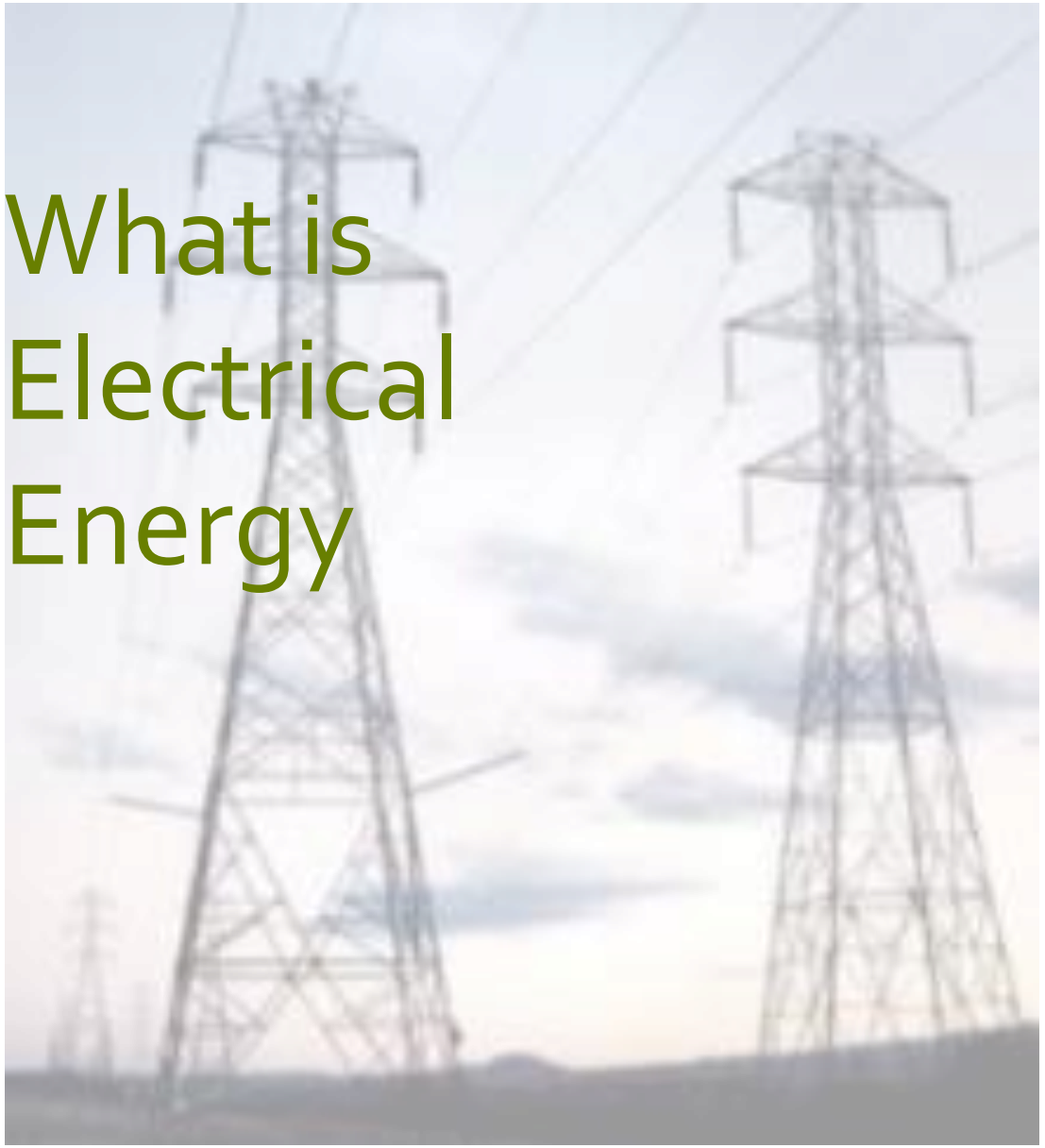
Tim Penyusun MK Pembangunan Berkelanjutan

RENEWABLE ENERGY





What is Electrical Energy



- Energy caused by the movement of electrons
- Easily transported through power lines and converted into other forms of energy

What is Chemical Energy

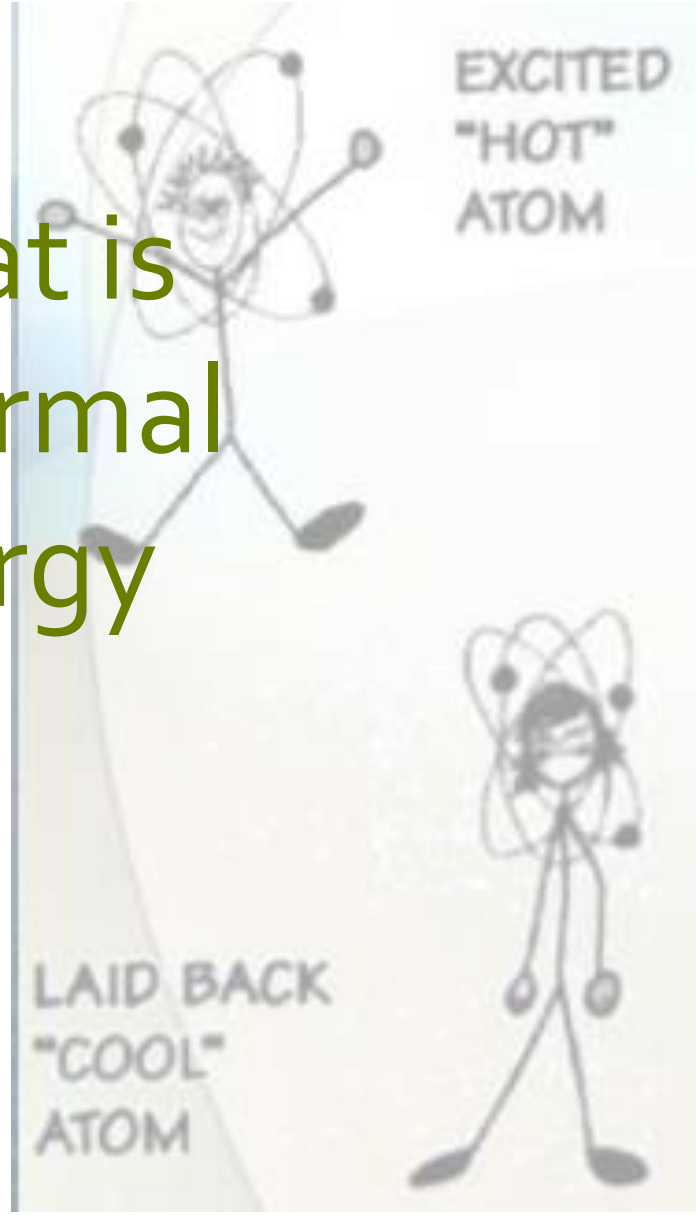
- Energy that is available for release from chemical reactions.

The chemical bonds in a matchstick store energy that is transformed into thermal energy when the match is struck.

What is Electromagnetic Energy

- Light energy
- Includes energy from gamma rays, xrays, ultraviolet rays, visible light, infrared rays, microwave and radio bands

What is Thermal Energy



- Heat energy
- The heat energy of an object determines how active its atoms are.

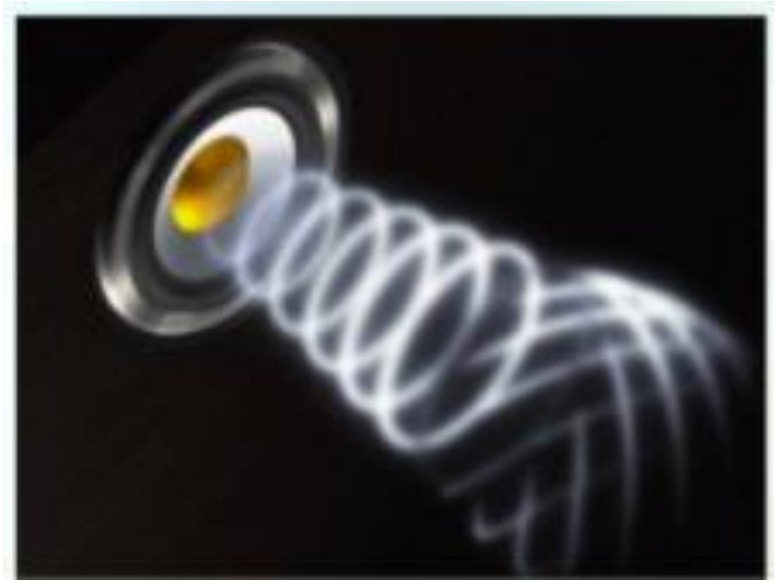
A hot object is one whose atoms and molecules are excited and show rapid movement.

A cooler object's molecules and atoms will show less movement.

Nuclear energy is the energy stored in the nucleus of an atom.

Nuclear energy is unusual in that it can give off energy in the form of light or heat.

What is Nuclear Energy



What is Sound Energy

Sound energy is the movement of molecules in the air that produces vibrations.

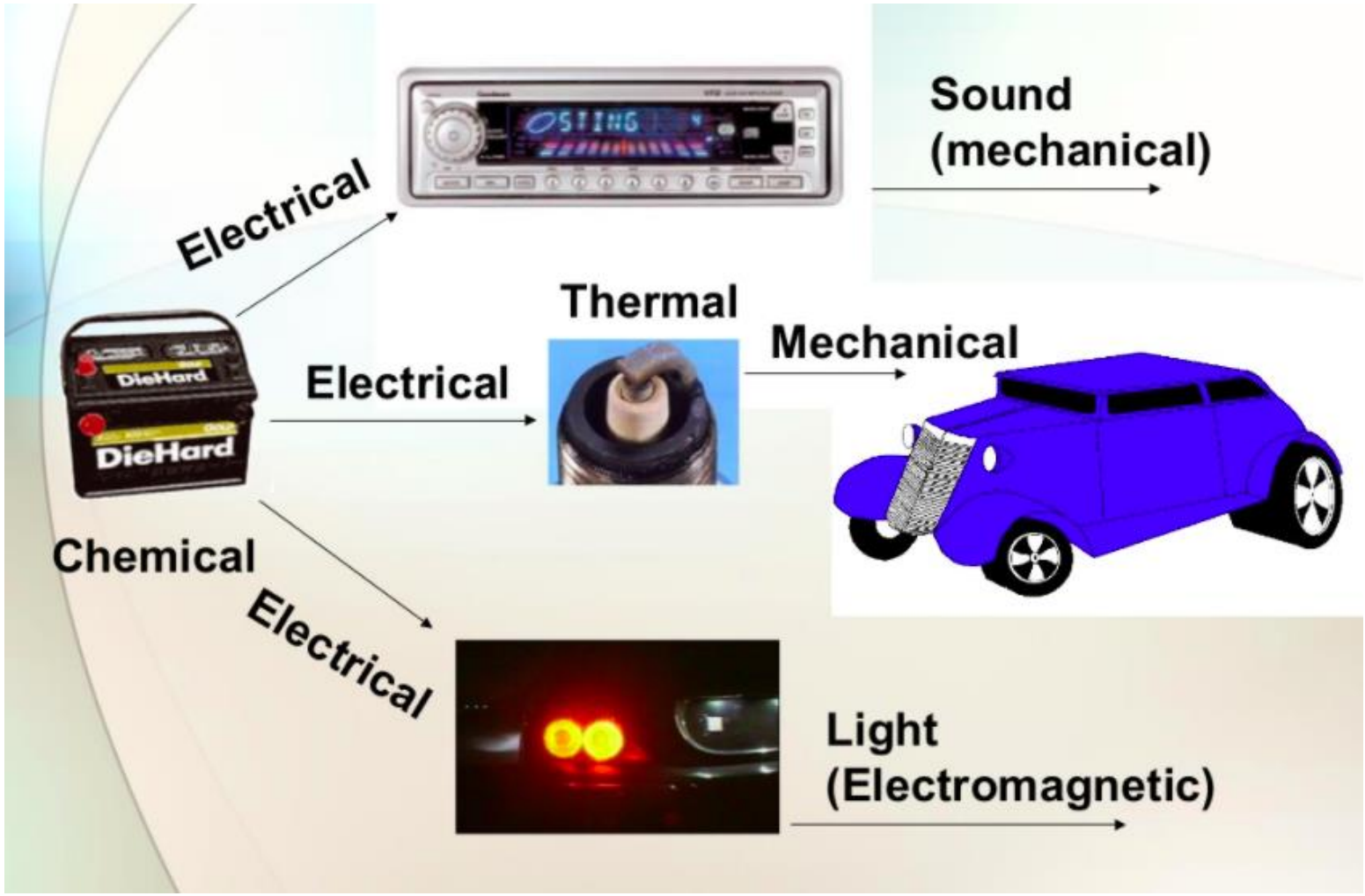
- Energy due to a object's motion (kinetic) or position (potential).

The bowling ball has mechanical energy.

When the ball strikes the pins, mechanical energy is transferred to the pins!

What is Mechanical Energy

Energy Transfer



What is a renewable energy source?

A renewable energy source means energy that is sustainable - something that can't run out, or is endless, like the sun. When you hear the term 'alternative energy' it's usually referring to renewable energy sources too. it means sources of energy that are alternative to the most commonly used non-sustainable sources like coal.

Types of renewable energy

Alternative or renewable energy comes from natural processes that (unlike those listed above) can reliably produce cheap energy with minimal impact to the environment.

The most popular renewable energy sources currently are:

1. Solar energy
2. Wind energy
3. Hydro energy
4. Tidal energy
5. Geothermal energy
6. Biomass energy
7. Waste energy

Solar energy

- Sunlight is one of our planet's most abundant and freely available energy resources. The amount of solar energy that reaches the earth's surface in one hour is more than the planet's total energy requirements for a whole year. Although it sounds like a perfect renewable energy source, the amount of solar energy we can use varies according to the time of day and the season of the year as well as geographical location. In many country, solar energy is an increasingly popular way to supplement your energy usage

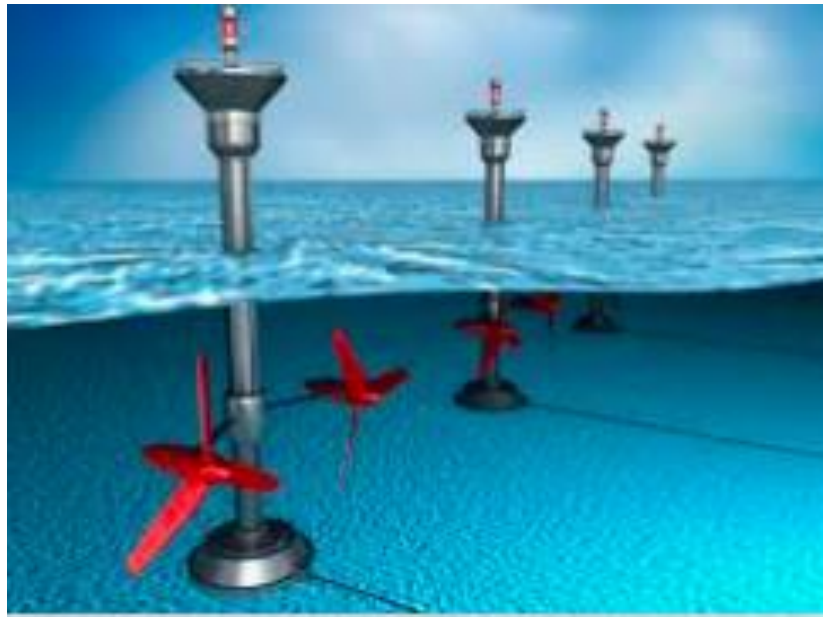
Wind energy

- Wind is a plentiful source of clean energy. **Wind energy** is a form of solar **energy**. **Wind energy** (or **wind** power) describes the process by which **wind** is used to generate electricity. **Wind** turbines convert the kinetic **energy** in the **wind** into mechanical power. Mechanical power can also be utilized directly for specific tasks such as pumping water.
- **It's sustainable.** Wind is actually a form of solar energy. Winds are caused by the heating of the atmosphere by the sun, the rotation of the Earth, and the Earth's surface irregularities. For as long as the sun shines and the wind blows, the energy produced can be harnessed to send power across the grid.

Hydro energy

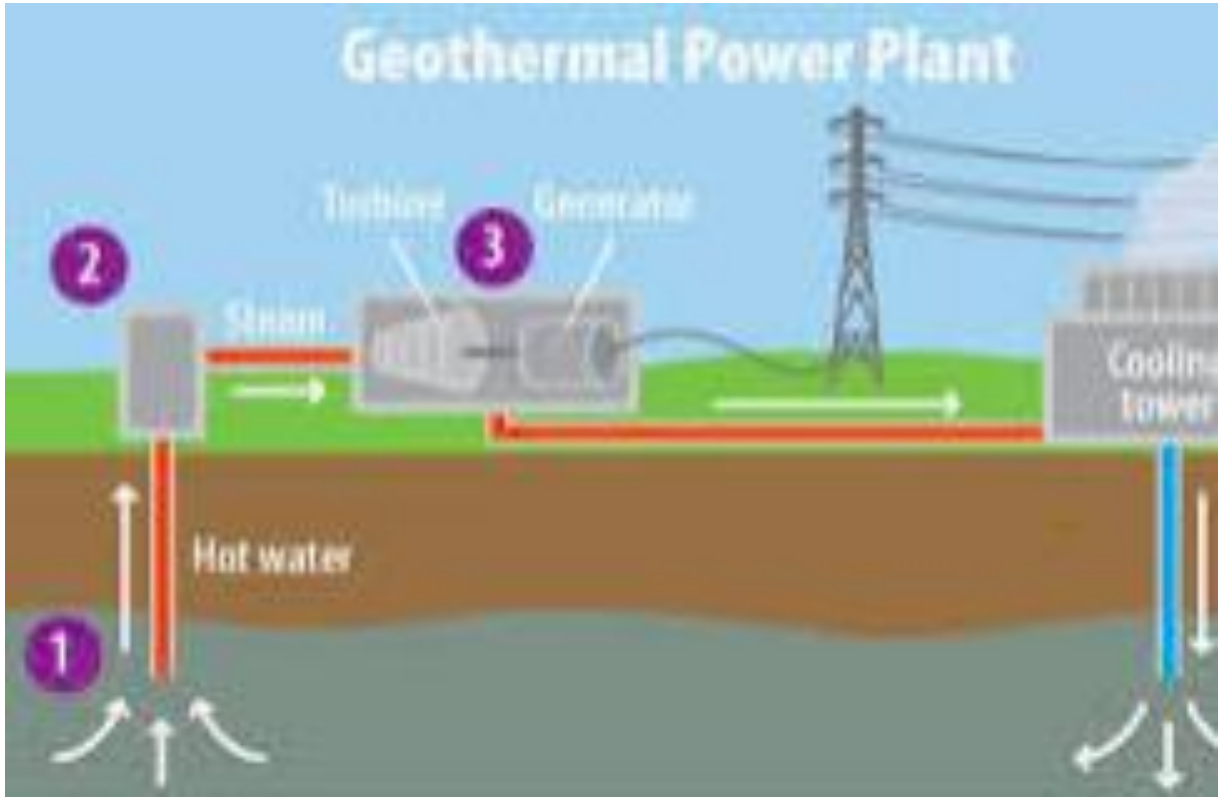
- As a renewable energy resource, hydro power is one of the most commercially developed. By building a dam or barrier, a large reservoir can be used to create a controlled flow of water that will drive a turbine, generating electricity. This energy source can often be more reliable than solar or wind power (especially if it's tidal rather than river) and also allows electricity to be stored for use when demand reaches a peak. Like wind energy, in certain situations hydro can be more viable as a commercial energy source (dependent on type and compared to other sources of energy) but depending very much on the type of property, it can be used for domestic, 'off-grid' generation.

Tidal Energy

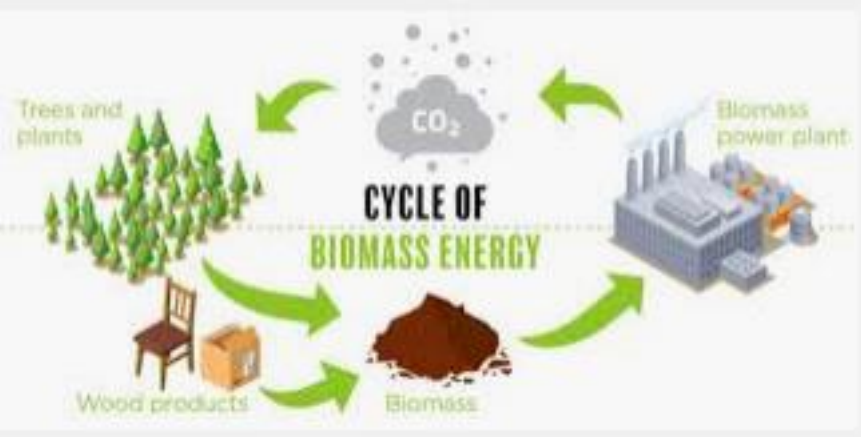


This is another form of hydro energy that uses twice-daily tidal currents to drive turbine generators. Although tidal flow unlike some other hydro energy sources isn't constant, it is highly predictable and can therefore compensate for the periods when the tide current is low.

Geothermal energy



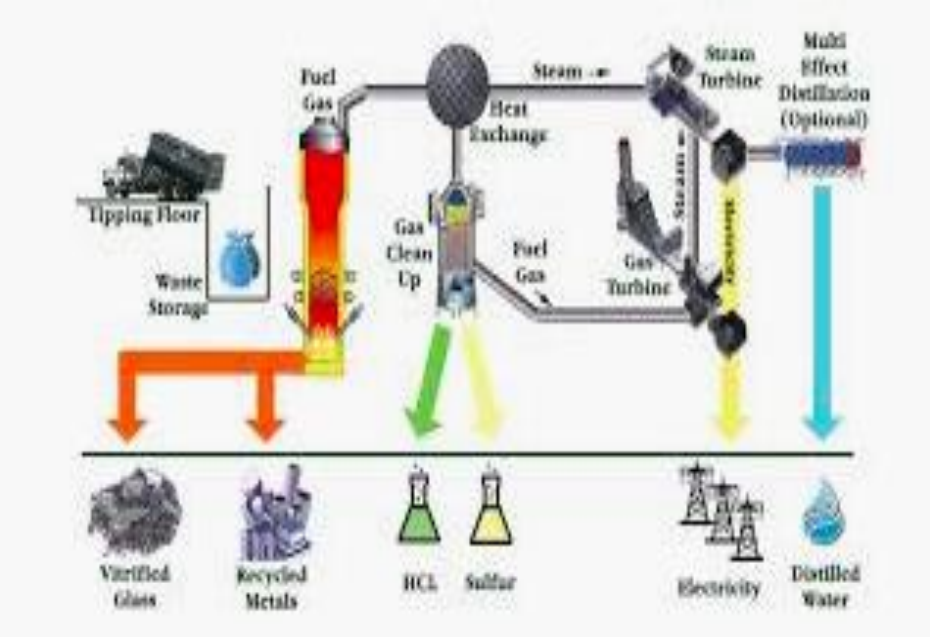
Geothermal energy is thermal energy generated and stored in the Earth. Thermal energy is the energy that determines
the temperature of matter. Heat from the earth can be used as an energy source in many ways, from large and complex power stations to small and relatively simple pumping systems. This heat energy, known as geothermal energy, can be found almost anywhere—as far away as remote deep wells in Indonesia and as close as the dirt in our backyards



Biomass Energy

Biomass is a clean, renewable energy source. Its initial energy comes from the sun, and plants or algae biomass can regrow in a relatively short amount of time. Trees, crops, and municipal solid waste are consistently available and can be managed sustainably.

Biomass energy is **energy** generated or produced by living or once-living organisms. The most common **biomass** materials used for **energy** are plants, such as corn and soy, above. The **energy** from these organisms can be burned to create heat or converted into electricity



Waste Energy

Waste management facility that combusts wastes to produce electricity. This type of power plant is sometimes called a trash-to-energy, municipal waste incineration, energy recovery , or resource recovery plant.

Modern waste to energy plants are very different from the trash incinerators that were commonly used until a few decades ago. Unlike modern ones, those plants usually did not remove hazardous or recyclable materials before burning. These incinerators endangered the health of the plant workers and the nearby residents, and most of them did not generate electricity.

What isn't a renewable energy source?

Nuclear power is alternative to traditional fossil fuels such as coal, oil and gas. It creates fewer airborne pollutants too but it is nonetheless a finite resource. Despite the fact that generating electricity from nuclear energy is a very different process to burning fossil fuels, nuclear power is not a renewable energy source.

As we rely on fossil energy sources we need to make them as efficient as possible. Although cleaner, more efficient technologies that reduce the environmental impact of fossil fuels are desirable, they are not renewable energy sources.

Burning wood instead of coal is slightly more complex. On the one hand, wood is a renewable resource - provided it comes from sustainably managed forests. Wood pellets and compressed briquettes are made from by-products of the wood processing industry and so arguably reduce waste. Compressed biomass fuels produce more energy than logs too. On the other hand, burning wood (whether it be raw timber or processed waste) releases particles into our atmosphere. Burning wood always results in deforestation and the reduction of natural habitats so although it can be a renewable energy source, it's not what we would call 'alternative'.

renewable energy can be realized if we…

- Aggressively seek a global sustainable energy economy
- Acknowledge and mitigate the carbon challenge with the necessary policies
- Accelerate investment in technology innovation

It is a matter of national will and leadership

Tugas

Lihat file "RTM-CPS201-Tugas 2 (b)"

Terima kasih