

Sustainable Energy

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What is Sustainable Energy?

- Sustainable energy is energy that can be used for an unlimited amount of time
- Does not run out or affect the resources the future will have
- Sustainable energy does not finish unlike unsustainable energy
- Sustainable energy does not cause harm to the environment and is found in many places.

Different Types of Sustainable Energy

There are many different types of sustainable energy. Some are:

- Solar Energy
- Wind Energy
- Geothermal Energy
- Ocean Energy
- Biomass Energy
- Hydroelectric Power

Solar Energy

- Solar energy is when the Sun's radiation becomes electricity.
- Radiation from the sun becomes electricity by the use of solar panels.
- Solar panels are installed on the roof of the house to collect as much light as possible so that it can generate a lot of electricity.
- Solar panels generate direct current electricity so a solar inverter is used to convert the direct current electricity into alternating current electricity so that it can be used in homes.
- Solar energy is best used in areas where there is plenty of sunlight so the power does not run out constantly.

Solar Energy

In these images there are solar panels on the roof of the house and building. The solar panels take in the light energy and then convert it into electricity.

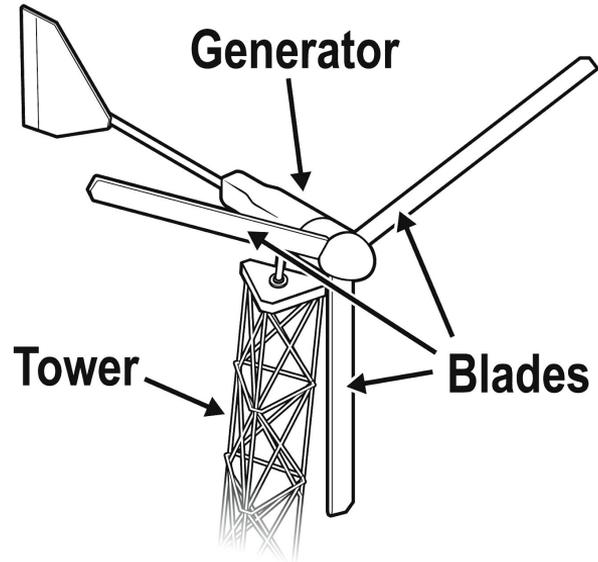


Wind Energy

- Wind energy is when wind currents convert into electricity.
- The wind converts into electricity by the use of wind turbines.
- Wind turbines have three blades and have a similar look to a fan.
- The wind turbine is placed about 100 feet from the ground so that it has faster wind and can spin faster.
- Wind turbines convert energy into electricity when wind blows past the blades of the turbine. The blades start spinning which starts a generator and the generator will generate electricity.
- Wind energy is best used in windy areas and that electricity will keep running.

Wind Energy

In these images there are wind turbines. As you can see the blades are placed high above the ground, to prevent turbulent and slow wind. The wind turbines spin from the wind causing the generator to start and convert wind power to electricity.



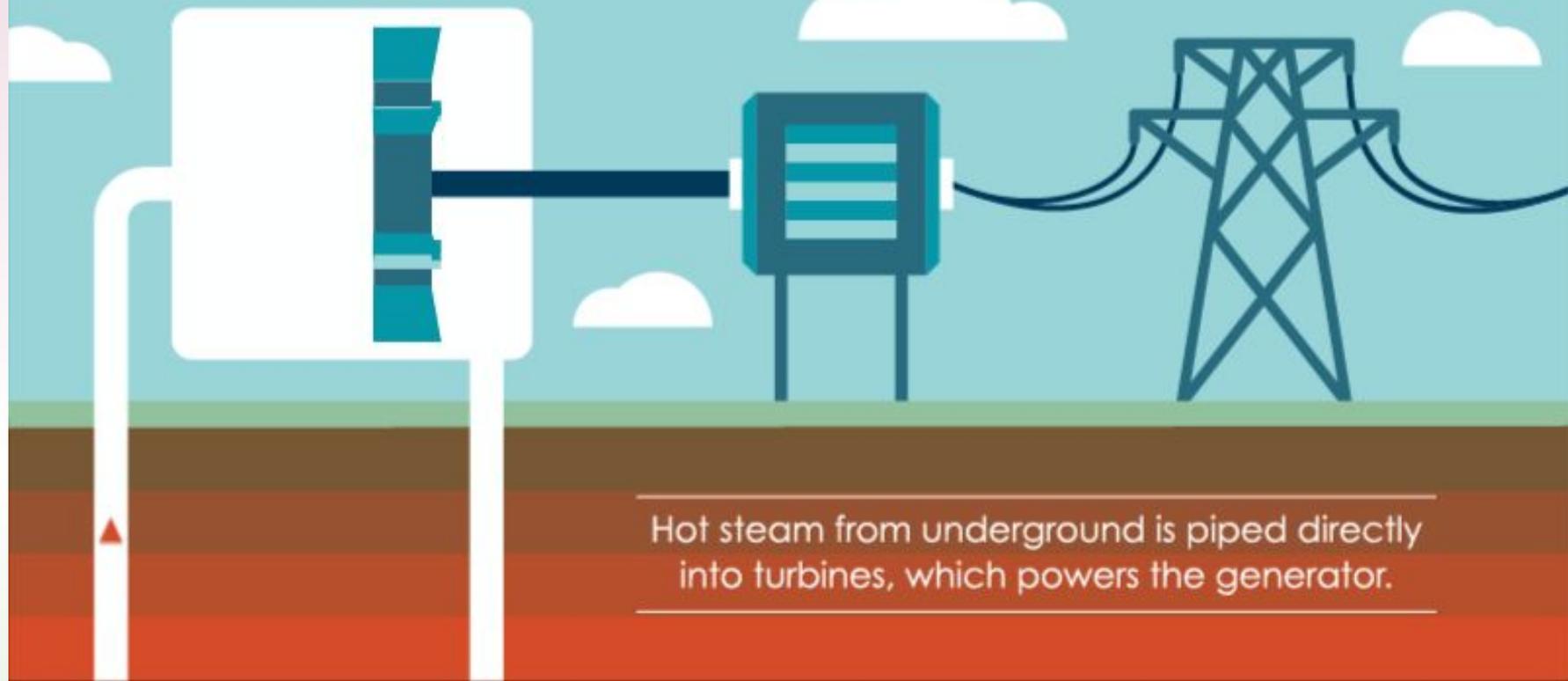
Geothermal Energy

- Geothermal energy is the heat in the Earth converted into electricity.
- The heat in the Earth is used by geothermal power plants which take steam which comes from reservoirs of hot water some miles below the Earth's surface. The steam from below the Earth's surface is used to rotate a turbine which activates the generator. The generator then starts to produce electricity.
- There are three main types of geothermal power plants. There are dry steam, flash steam, and binary cycle geothermal power plants.

Dry Steam Geothermal Power Plants

- Dry steam geothermal plants are known to be the most common geothermal plants.
- They take steam directly from underground reservoirs to the power plant which it is then transferred to the turbines which start spinning due to all the pressure.
- This then powers the generators and produces electricity.
- Once the steam powers the generator, it condenses into water and goes into an injection well which takes it back to the Earth.

DRY STEAM POWER PLANT

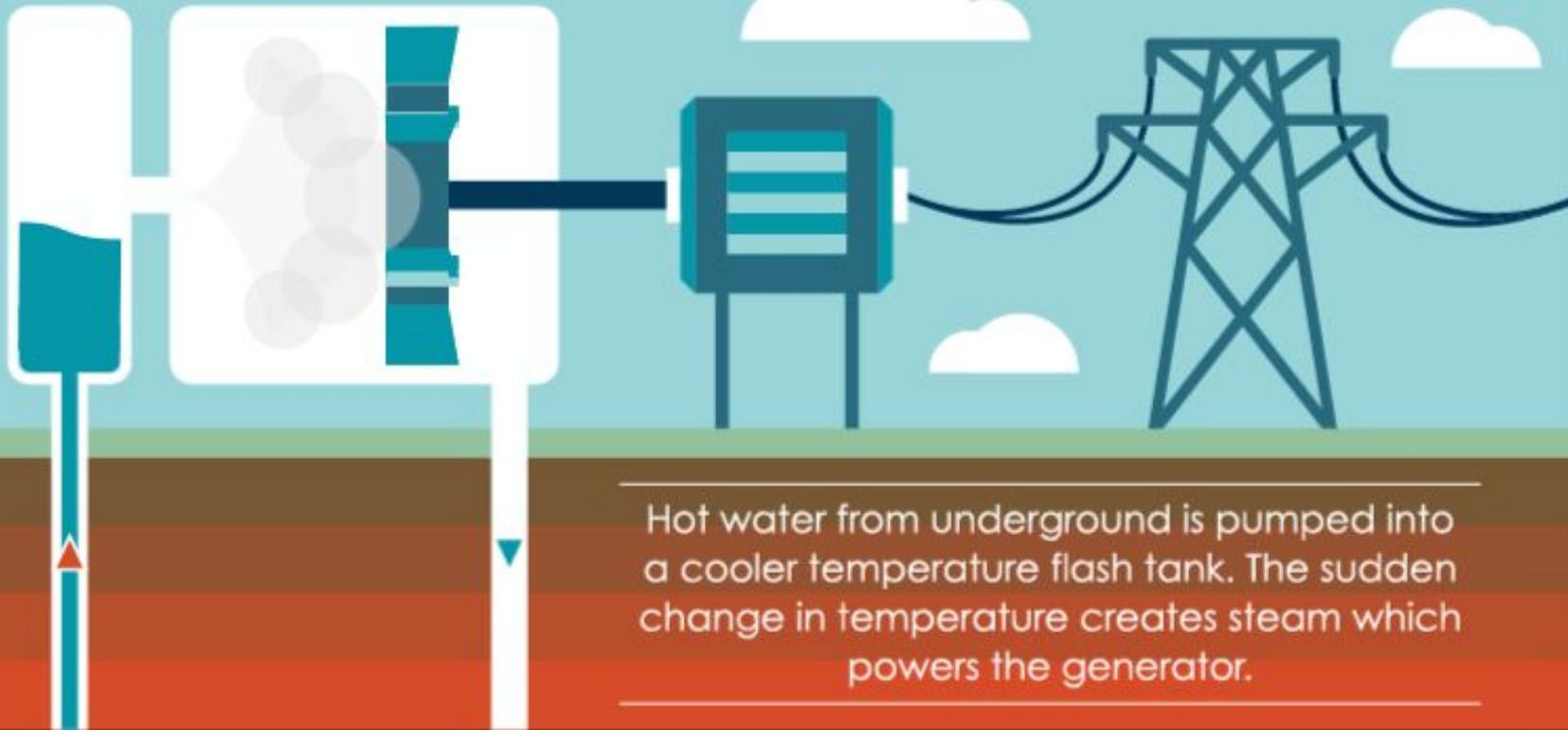


Hot steam from underground is piped directly into turbines, which powers the generator.

Flash Steam Power Plants

- Flash steam power plants are different from dry steam power plants due to the fact that flash steam power plants pump hot water instead of steam.
- The water is sent to a flash tank which is at a low temperature, making the water rapidly turn into steam then transferred to the turbines which start spinning due to all the pressure.
- This then powers the generators and produces electricity. Once the steam powers the generator, it becomes cool and condenses into water and goes into an injection well which takes it back to the Earth.

FLASH STEAM POWER PLANT

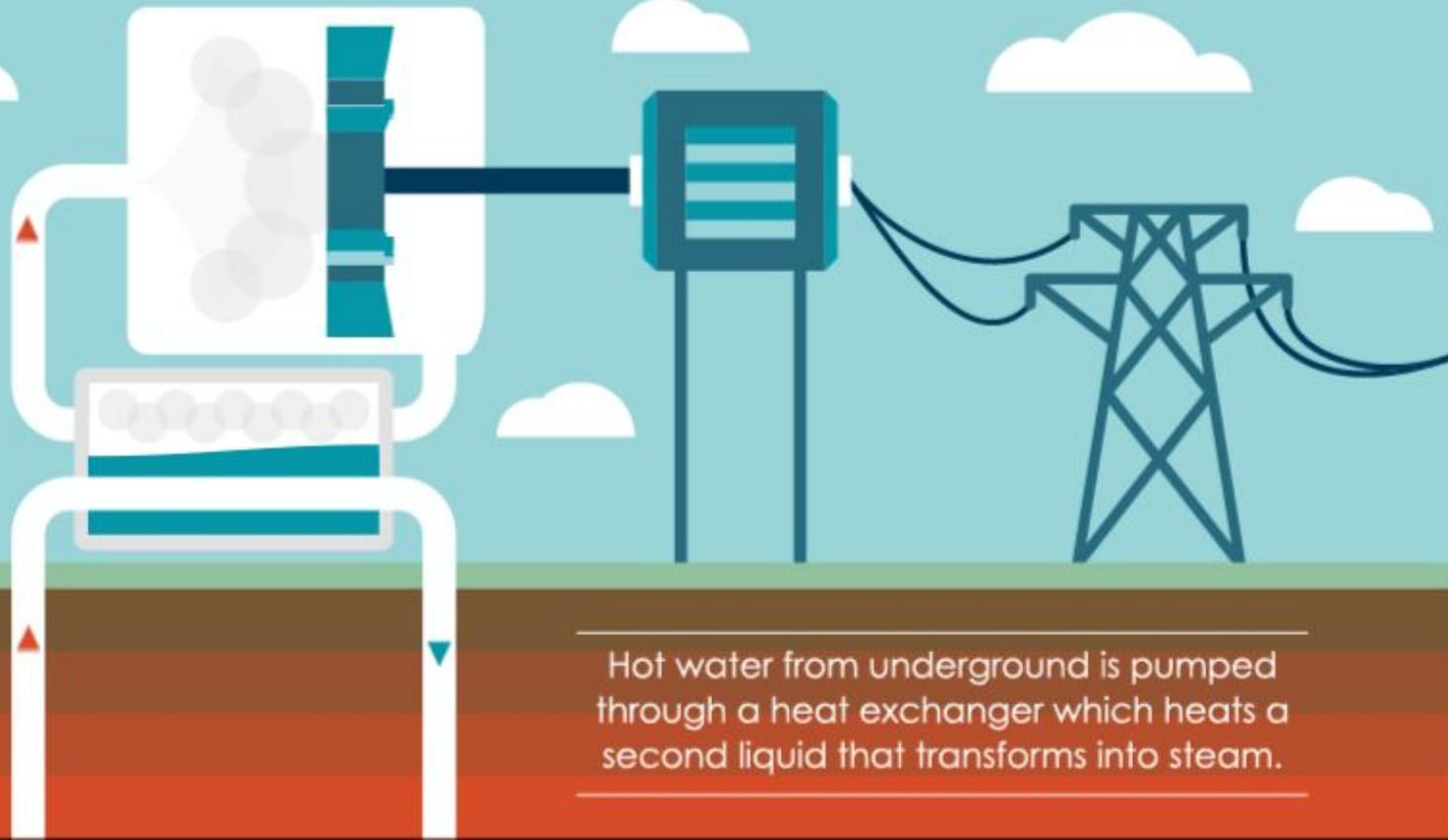


Hot water from underground is pumped into a cooler temperature flash tank. The sudden change in temperature creates steam which powers the generator.

Binary Cycle Power Plants

- The water or steam used in binary cycle geothermal plants do not directly get sent to the turbines.
- The water is pumped from reservoirs to a heat exchanger where it heats another liquid.
- The second liquid becomes steam due to the heat and is then sent into a turbine and rotates it which starts the generator.
- The second liquid is then sent back into the heat exchanger to be reused.
- The hot water is then sent back to the earth through an injection well.

BINARY CYCLE POWER PLANT



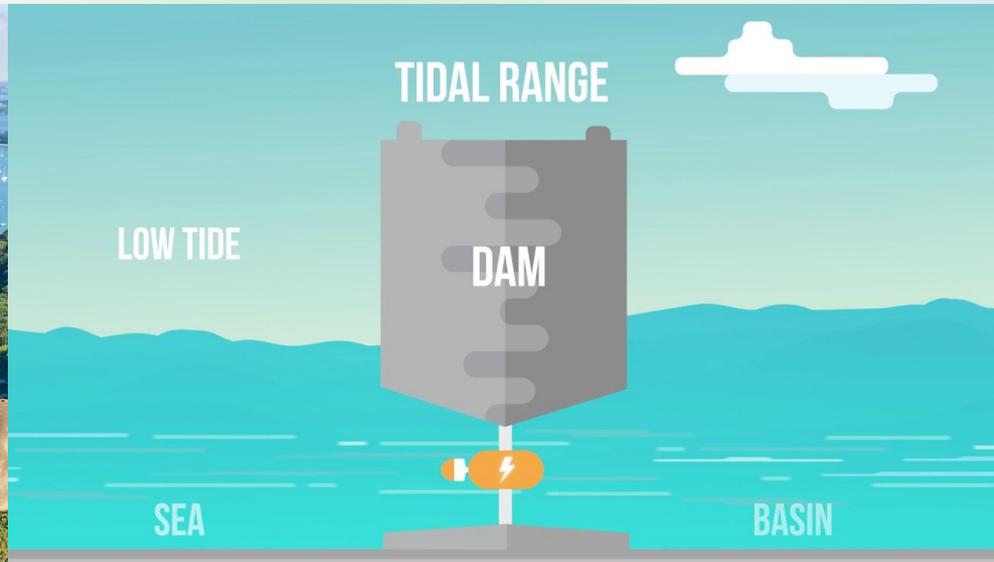
Hot water from underground is pumped through a heat exchanger which heats a second liquid that transforms into steam.

Ocean energy

- The ocean can make thermal energy by the sun's radiation and mechanical energy by the ocean's tides and waves.
- Mechanical energy can be generated when tidal waves generate electricity by a dam.
- The mechanical ocean energy is made when a dam pressures the tidal waves of the ocean to rotate turbines and start the generator.
- Mechanical ocean energy plants are best used in areas where the most potential waves and tides are.

Ocean Energy

In these images this is how to generate mechanical ocean energy. There are dams for mechanical ocean energy. As the water tides and waves flow the dam pressurises it making it move the turbine. This then starts the generator and generates electricity.

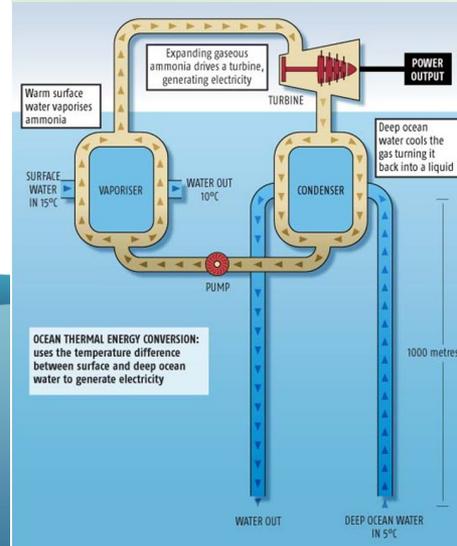
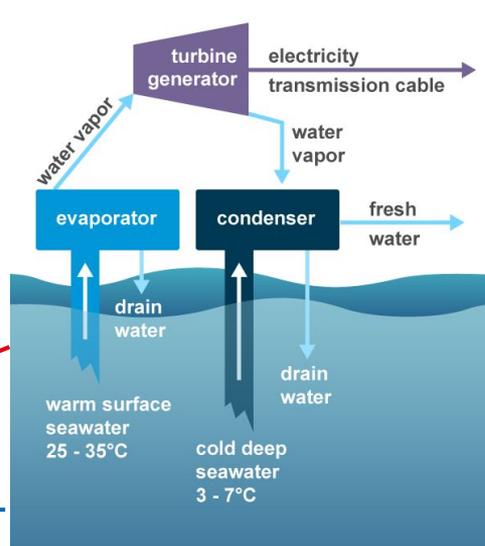
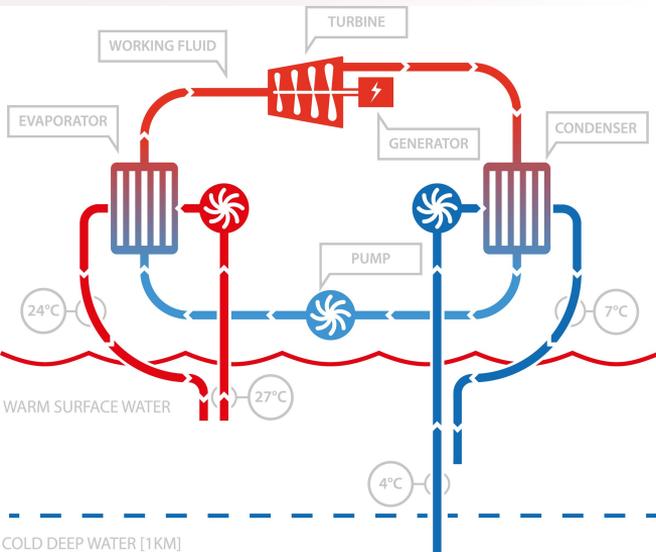


Ocean Energy

- Thermal energy can be generated when the sun's radiation heats the ocean surface water.
- A system known as the Ocean Thermal Energy Conversion uses warm surface water to produce electricity.
- This surface water is pumped through an evaporator and becomes a vaporized fluid which is then taken into the turbine to start the generator and generate electricity.
- This vaporized water then becomes a liquid in a condenser and is pumped back into the ocean.
- Thermal ocean energy generators are best used in tropical areas since heat is a big factor in this type of generator.

Ocean Energy

In these images this is how to generate thermal ocean energy. There are several converters for generating electricity in this method. As the sun heats the water the heated water is taken to be converted into steam and rotate the turbine to start the generator.

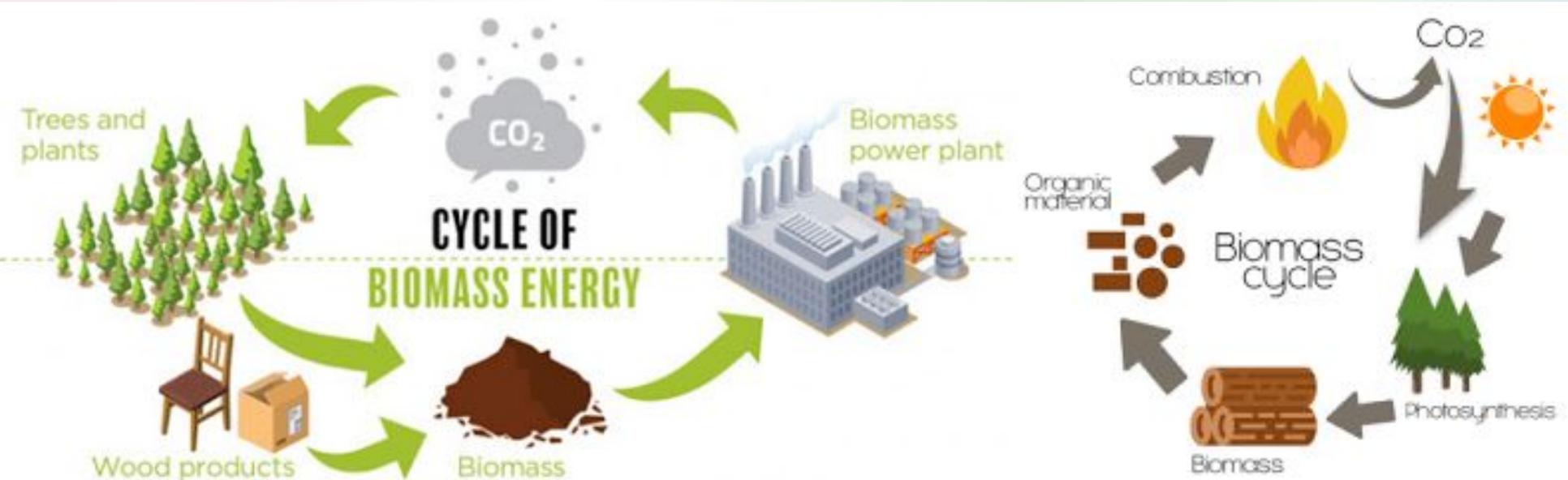


Biomass energy

- Biomass energy is when wastes or living or once living organisms like plants are used to generate electricity.
- Biomass contains energy from the sun.
- Plants absorb this energy using photosynthesis.
- Biomass can be converted into electricity when burned or heated.
- It can also become biofuel.
- Most of the time biomass energy is produced during combustion. This is when biomass is heated in a boiler to make pressurised steam.
- The pressured steam is then sent to the turbines to rotate them. This then starts the generator and generates electricity.

Biomass Energy

In these images there is the cycle of biomass energy. As trees and plants become biomass, they are then sent to a biomass power plant which burns the biomass and converts it into useful energy. The cycle is completed as the plant releases CO₂, which is then taken up by trees and plants through photosynthesis.

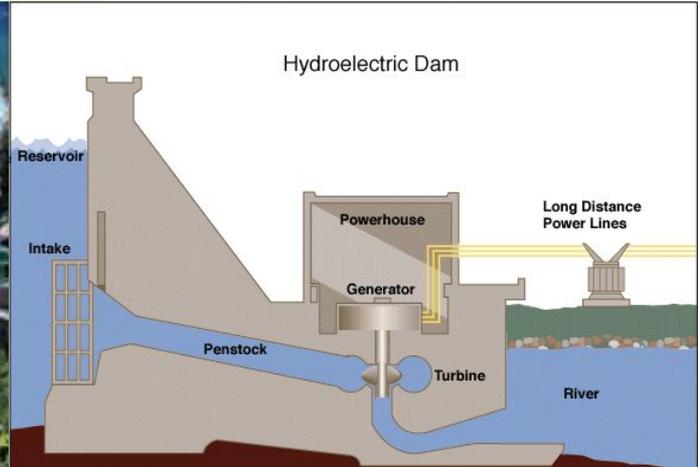


Hydroelectric energy

- Similar to ocean energy, hydroelectric energy uses water that is stored in reservoirs.
- By the help of a dam the water is more pressurised.
- As the pressured water flows hardly through the dam, it rotates a turbine which will start the generator and generate electricity.

Hydroelectric Energy

In these images there are hydroelectric power plants. As the dam pressurizes the water the water flows through the dam and turns the turbine, starting the generator and generating electricity.



Why Should We Use Sustainable Energy and How Will It Improve The World?

- We should use sustainable energy instead of non-sustainable energy because non-sustainable energy will at some point run out.
- Sustainable energy can be used without running out.
- Sustainable energy meets the needs of today while having resources for the future generations as well.
- Sustainable energy will also reduce the amount of global warming since our non-sustainable resources when burned create carbon dioxide and several other global warming emissions.
- Sustainable energy helps reduce health problems since sustainable energy does not make pollution.

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RinkeshA true environmentalist by heart . Founded Conserve Energy Future with the sole motto of providing helpful information related to our rapidly depleting environment. Unless you strongly believe in Elon Musk’s idea of making Mars as another habitable planet . “Sustainable Energy: Why We Need and Various Types of It.” *Conserve Energy Future*, 1 Sept. 2020, www.conserve-energy-future.com/sustainableenergy.php.

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