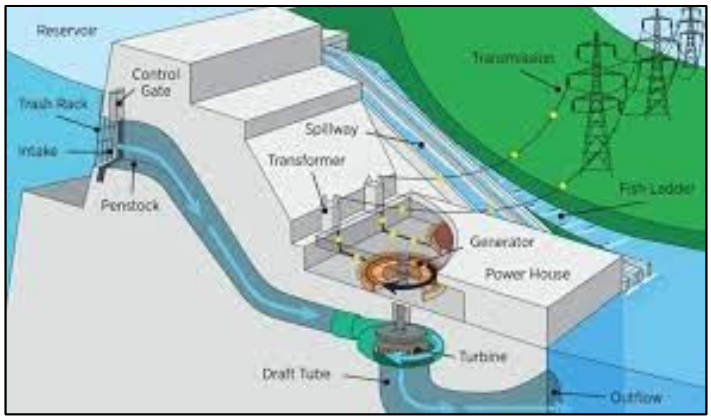
PRACTICAL 10: Define the terms renewable resource and non-renewable and give examples of each resource type that are related to forage production

A **natural resource** is something supplied by nature that helps support life. When you think of natural, you may think of minerals and fossil fuels. However, ecosystems and the services they provide are also natural resources. **Biodiversity** is a natural resource as well.

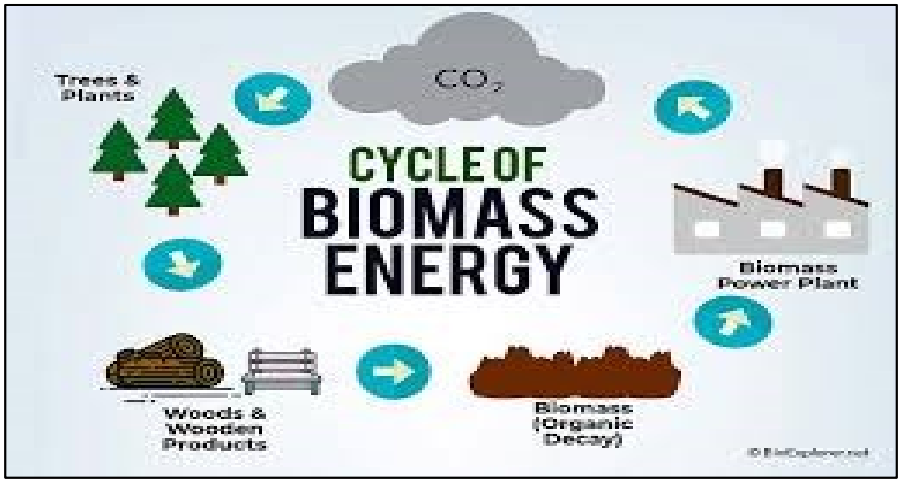
➢ Renewable Resources:

Renewable resources can be replenished by natural processes as quickly as humans use them. Examples include sunlight and wind. Renewable resources include biomass energy (such as ethanol), hydropower, geothermal power, wind energy, and solar energy.Metals and other minerals are renewable too. They are not destroyed when they are used and can be recycled.

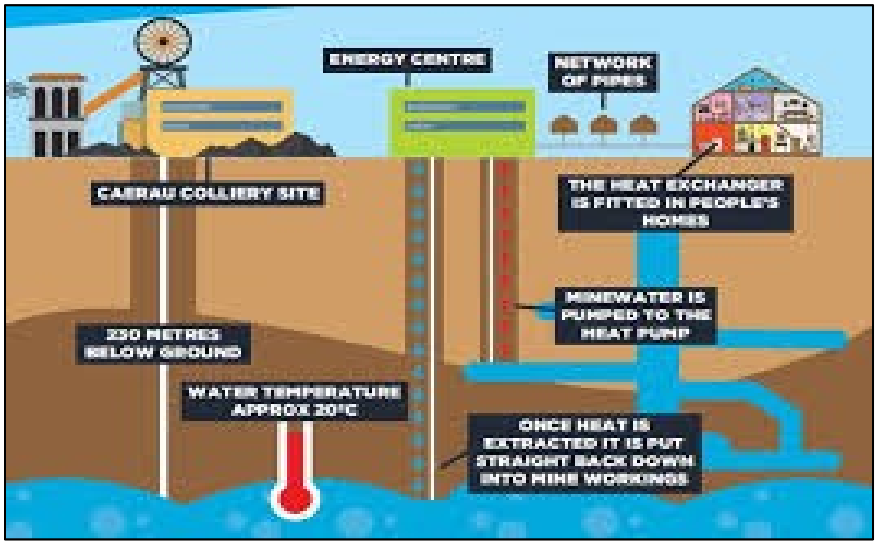
- Wind energy generates electricity by turning wind turbines. The wind pushes the turbine's blades, and a generator converts this mechanical energy into electricity. This electricity can supply power to homes and other buildings, and it can even be stored in the power grid.



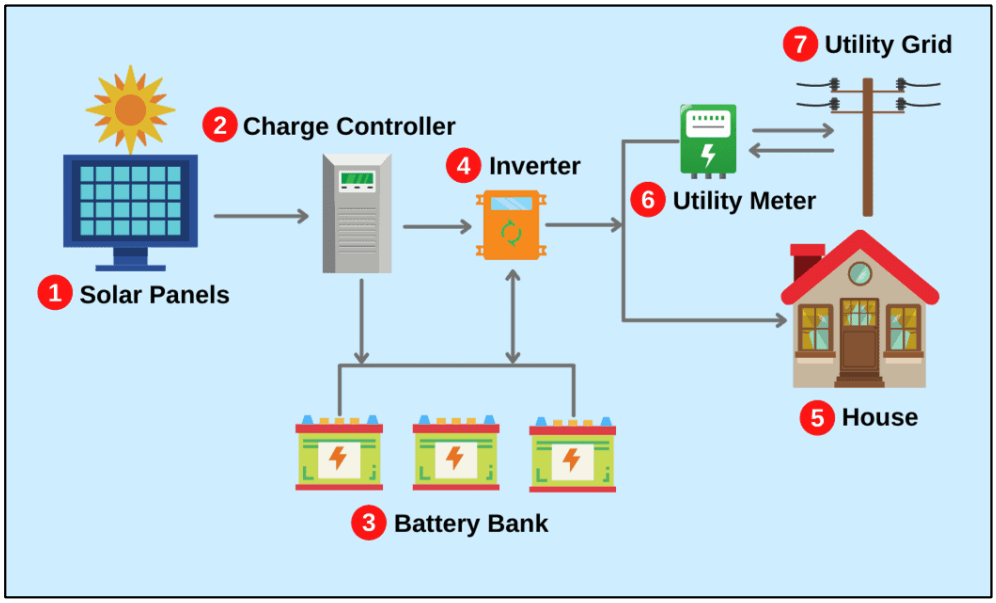
- **Hydropowe**r is one of the oldest renewable resources and has been used for thousands of years. Today, every U.S. state uses some amount of hydroelectricity. With hydropower, the mechanical energy from flowing water is used to generate electricity. Hydroelectric power plants use the flow of rivers and streams to turn a turbine to power a generator, releasing electricity.



- **Biomass** refers to organic material from plants or animals. This includes wood, sewage, and ethanol (which comes from corn or other plants). Biomass can be used as a source of energy because this organic material has absorbed energy from the Sun. This energy is, in turn, released as heat energy when burned.



- **Geothermal energy** comes from the heat generated deep within the Earth's core. Geothermal reservoirs can be found at tectonic plate boundaries near volcanic activity or deep underground. Geothermal energy can be harnessed by drilling wells to pump hot water or steam to a power plant. This energy is then used for heating and electricity.



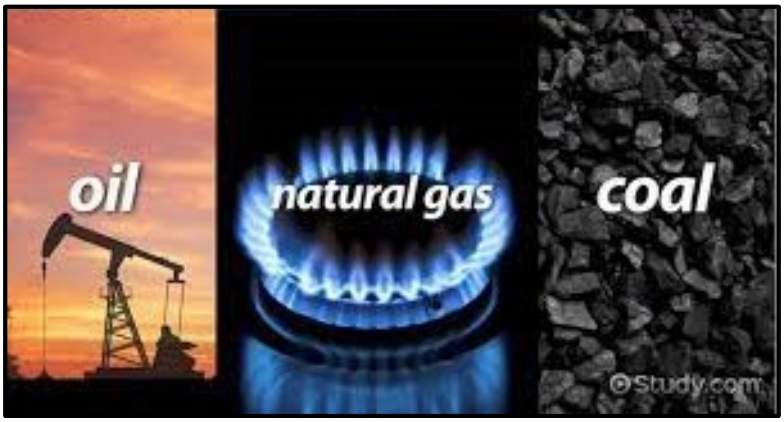
- **Solar Energy:** Radiation from the Sun can be used as a power source as well. Photovoltaic cells can be used to convert this solar energy into electricity. Individually, these cells only generate enough energy to power a calculator, but when combined to create solar panels or even larger arrays, they provide much more electricity.

Living things are considered to be renewable. This is because they can reproduce to replace themselves. However, they can be over-used or misused to the point of extinction. To be truly renewable, they must be used sustainably. **Sustainable use** is the use of resources in a way that meets the needs of the present and also preserves the resources for future generations.

- **Non-renewable Resources**

Non-renewable resources are natural resources that exist in fixed amounts and can be used up. Examples include fossil fuels such as petroleum, coal, and natural gas. These fuels formed from the remains of plants over hundreds of millions of years. We are using them up far faster than they could ever be replaced. At current rates of use, petroleum will be used up in just a few decades and coal in less than 300 years. Nuclear power is also considered to be a non-renewable resource because it uses up uranium, which will sooner or later run out. It alsoproduces harmful wastes that are difficult to dispose of safely.

Supporting more people means producing more food, which in turn requires greater amounts of energy, soil nutrients, water, and other resources associated with agricultural production There are many types of resources that go into producing food and producing forages. In general these resources have been grouped into two types: renewable resources and non-renewable resources. Renewable resources may be defined as resources that have the potential to be replaced over time by natural processes. The renewal process may be relatively quick, as with sunshine which comes on a daily basis. Or, the renewal process may be very slow, as in the formation of soil which may take hundreds of years. Non-renewable



resources may be defined as resources whose stock or reserves is limited or fixed. The available supply of non-renewable resources may be replenished through recycling (e.g. recycling aluminium cans), but the overall supply remains relatively constant.

- **Oil**

Crude oil is a fossil fuel that's used to make gasoline, diesel fuel, jet fuel, heating oil, lubricating oils, and asphalt. This nonrenewable resource is a liquid that's extracted from underground reservoirs, sedimentary rocks, and tar sands. The crude oil is shipped to refineries where it's separated into petroleum products.

- **Natural Gas**

Natural gas is obtained by drilling into rock formations that contain natural gas deposits. There are several places natural gas can be obtained:

Conventional natural gas is found in large cracks and spaces in rock formations

Shale gas or unconventional natural gas is found in tiny pores within rocks

Associated natural gas is found in crude oil deposits

When natural gas is withdrawn from its origin, it contains natural gas liquids (NGLs) like ethane, propane, butanes, pentanes, and water vapor. This wet natural gas is sent to processing plants where the NGLs are removed from methane. The methane in natural gas is used in fuel.

- **Coal**

Coal is a sedimentary rock that contains carbon and hydrocarbons. It's a fossil fuel that takes millions of years to form and contains energy stored by plants. There are four types of coal:

Anthracite has the highest heating value and contains 86-97 percent carbon; it's used in the metals industry.

Bituminous coal contains 45-86 percent carbon and is the most abundant type of coal found in the United States; it's used for generating energy and for making iron and steel.

Subbituminous coal contains 35-45 percent carbon and has the lowest heating value among the four types of coal.

Lignite contains 25-35 percent carbon and has the lowest energy content among the four

types of goal as well as the highest moisture content; it's used to generate electricity.

- **Uranium**

Uranium isn't a fossil fuel, but it's still considered a common nonrenewable resource. While uranium is a common metal found in rocks, U-235 is a component of uranium that's very rare. U-235 is extracted from uranium and processed to be used as fuel in nuclear plants for nuclear fission.