1.**PROBLEMS WITH CURRENT ENERGY USE**

- **Environmental factors**
  Energy sources such as coal, oil, natural gas among others release green houses polluting the air and waste products water sources which causes is water pollution. They also contribute to climate changes like global warming, extreme weather patterns and rising of sea levels.

- **Depletion of resources**
  As energy sources continue to get used over time their availability diminishes for, they are renewable sources of energy. Destructive practices such as hydraulic fracturing are one of the destructive means in the obtaining of such resources.

- **Energy inefficiency**
  When traditional power plants are involved, they have low conservation efficiencies, outdated infrastructures and distribution systems that lead to energy loss through transmission over long distances. Buildings and energy efficiency appliances lacking energy efficiency designs resulting to excessive energy consumption.

These problems that are associated by energy sources can be solved by:

1. Transitioning to cleaner and renewable sources of energy such as wind turbines which convert kinetic energy of wind to electricity. Hydroelectric power which is developed by capturing moving water which runs turbines and is converted to electricity. There is also solar energy derived from the sun through photovoltaic panels or concentrated solar power systems.
2. Electrification and decentralization. The reduction of use of fossil fuels can be approached by promoting electricity use in transportation and heating and pairing it with decentralized energy systems.
3. Promoting energy education and awareness among individuals and communities. The educating the mass involves encouraging energy conservation, efficiency and the adoption of clean energy resources. This is by education campaigns, public outreach and policy advocacy.

THE ENERGY MARKET SHARE OF VARIOUS ENERGY SOURCES FROM 1800 TO DATE AND IN THE FUTURE

1800-1900

- It was primarily dominated by traditional sources of energy which was used in cooking and heating. Such were like biofuels like whale oil and vegetable oils.

The market share was as follows:

- ✓ Biofuels which included of agricultural waste; animal dung a wood, remained the main source up to the nineteenth century.

1950-2000

- ✓ Fossil fuels.
  Coal: this one remained dominant throughout the 20th century.
  Oil: it fuelled transportation, electricity generation and industrial applications
  Natural gas started to emerge for heating and individual purposes
- ✓ Nuclear power. It developed due to the emergence of nuclear reactors and power plants were built in many countries.
- ✓ Renewable sources of energy developed due to concern in climate change and sustainability.

Future

The use of renewable sources of energy is developing due to improved efficiency, failing costs and increased investments.
Natural gas will also be advantageous to use due to its lower carbon emissions.
The use of coal decreases due to more carbon emissions to the atmosphere

An increasing need for the use of vehicle and motors contributes for oil to still be in use.
The future depends on policy decisions and the strategic increase in technology.

REASONS WHY ELECTRICITY PRODUCTION HAS INCREASED CONSTANTLY OVER THE YEARS.

i. **Technological advancements**
   the increased use of computers, smartphones; energy consuming gadgets have led to a more demand in the use of electricity.
   Also, advancement in the health sector, manufacturing, transportation and telecommunication which also require electricity in their operation.

ii. **Urbanization**

The movement of people from rural areas to densely populated areas where the demand for electricity by them is high. Electricity will be used for lighting, heating, transportation, infrastructure production among others.

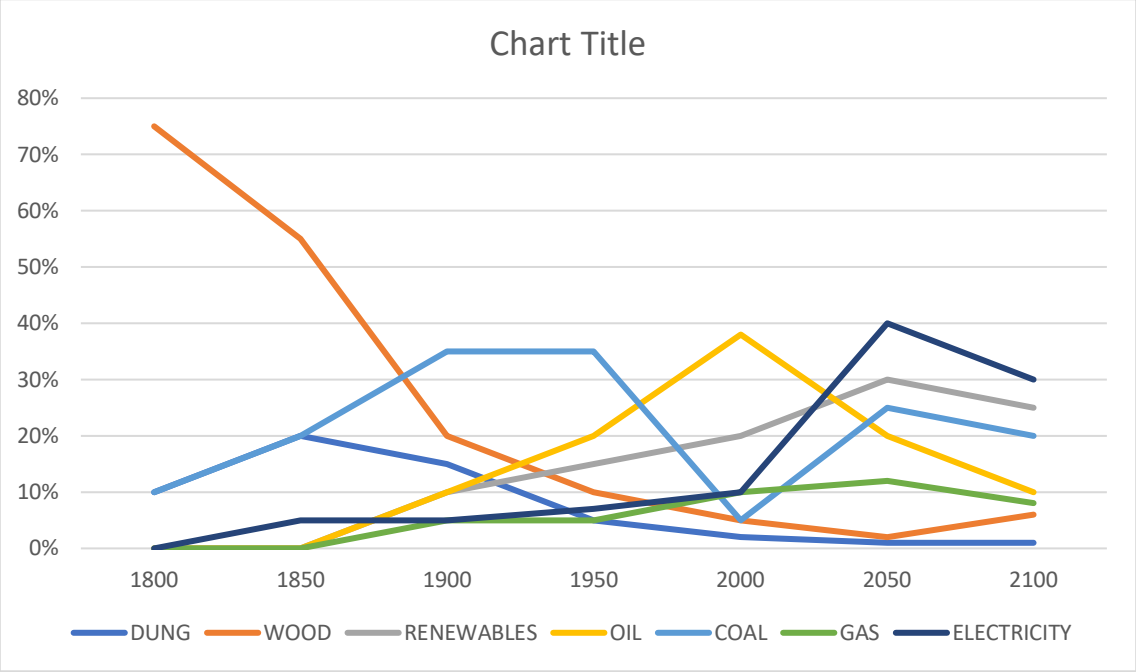
iii. **Population growth**

The greater number of people globally, the increase in the more demand of electricity in businesses, industries and residentials leading to more electricity production to meet the needs of everyone.

COMMENTS ON GLOBAL ELECTRICITY CONSUMPTION.

- ✓ Electricity consumption has steadily increased over the years where it is driven by the population growth, industrialization and technological advancements.
- ✓ It has also been driven by emerging trends and economics where industries grow and living standards increase and large consumption of electricity for residential, commercial and industrial purposes.
- ✓ Despite the use of electricity improving life, it is a challenge in terms of sustainability and the environment

GLOBAL ENERGY TRANSITION FROM 1800 TO THE FUTURE



GLOBAL ENERGY TRANSITION FROM 1800 TO THE FUTURE

CONCLUSIONS DRAWN FROM THE SANKEY DIAGRAM

1.The diagram shows a shift in energy sources which is significant.

- In the early stages, biomass is the dominant energy source and with time, it shifts towards fossil fuels and later on renewable sources of energy

2. It also indicates a rapid rise in the use of fossil fuels especially coal and oil. This is due to increased industrialization, transportation and electricity demand. they are likely to dominate until the mid to late 20^{th} century.

3. The diagram also displays a notable rise in renewable energy sources. Gradually fossil fuels will be replaced by the renewable sources.

4. Energy sources such as solar and wind which are decentralized are dominating the centralized energy systems which traditionally dominated the energy landscape.

5. renewable energy is becoming more efficient and abundant because it is being utilized in transportation heating and industrial processes thus contributing to the decrease of the share of fossil fuels.

6. the diagram illustrates the energy flow and energy intensities , addressing useful and rejected energy as time progresses

7. It shows the total energy end use as well as the useful and rejected energy. Its usefulness depends on the its demand in sectors like commercial, industrial, agricultural and transportation.

8. the core power of energy transitions is still to drive the production of new energy as the global leading source replacing fossil energy.

9. the transitioning to renewable energy to mitigate climate change and can also be complimented with negative emmissions technologies ton ensure climate security.

10. energy can be changed from one form to another but it cannot be created or destroyed and the total amount of energy does not change.

ENVIRONMENTAL ISSUES OF COAL.

a. **Air pollution**

   Release of harmful products to the atmosphere and gases such as sulphur dioxide, nitrogen oxide and mercury.

   These gases contribute to smog, acid rain, respiratory problems among others.

b. **Climate change**

   This is caused by the concentration of gases in the atmosphere.

   The climate changes include rising of global temperatures, changing weather patterns, melting of icecaps and glaciers.

c. **Water pollution**

   Coal mining and ash which involved removal of soil and rock which can contaminate nearby water.

   Coal ash which is a by product of coal has arsenic, lead, mercury which can lead into ground water during mining and get contaminated.

d. **Health impact**

   The release of gases and arsenic products (pollutants) can lead to respiratory complications and cardiovascular problems.

   Accidents can also happen in the mining areas leading to casualties or death

e. **Land degradation**

   The extraction of coal involves removal of soil layers leading to deforestation and habitat destruction thus disrupting the ecosystem.

GLOBAL WARMING AND ESTIMATES ABOUT FUTURE TEMPERATURE RISE.

Global warming is the long term increase in earth average surface temperature due to human activities and the accumulation of greenhouse gases in the atmosphere. The human activities include the burning of fossil fuels such as coal, oil and natural gas.

Global warming has various consequences;

The average global temperatures have been increasing over the first centuary with the last few decades being the warmest. The warmth leads to heatwaves and increased frequency of extremely hot days.

Global warming has also accelerated the melting of glaciers an ice caps in the polar regions and mountainous areas contributing to the rise of sea levels thus threatening the coastal communities.

Global warming intensifies weather phenomena such as hurricanes, typhoons, droughts and heavy rainfall events which can result to harsh impacts on human lives, ecosystems and infrastructure.