ENERGY

MARKING SCHEME

1.1995 SECTION B QUESTION 3 (a, b, c & d)

(a) Name four sources of electric power than water: -

Coal, Oil, Solar energy/sun, Nuclear/atomic energy, Geothermal energy, Bio gas, Wind

(b) List five factors that favours the location of hydro-electric power plant: -

- Fast flowing water/waterfall to drive the turbines/head of water
- Large volume of water
- Constant flow of water/river without great fluctuations
- Availability of space for reservoir/low populated area
- Hard basement rock for foundation
- Narrow gorge/valley
- Government policy

(c) Explain five ways in which Kenya has benefited from the development of Seven Forks

- Government earn some income/revenue from electricity sales
- The scheme generates electricity, which is used for industrial/domestic purposed.
- Dams have modified the local climate and vegetation
- The project provides sites that are tourist attractions
- It has led to control of floods in the lower parts of Tana enabling people to make use of the valley
- The project has created reservoirs, which provides fishing grounds
- Some of the dams provides water for irrigating the nearby farms

(d) Explain three problems that Kenya faces as a result of over dependence on petroleum.

- The country does not produce crude oil hence relies on importation/ignoring other factors of the economy
- When there is a sharp increase in oil prices. Kenya spends large amounts of her revenue importing oil/this affects balance of payments
- When oil prices are high, the cost of manufactured goods and services increase causing inflammation in the country
- The oil producing and exporting countries dictate the prices without consulting the consumer countries such as Kenya. This necessitates higher taxation to create revenue for importing oil
- Kenya exercises a higher shortage of petroleum products e.g. gas/destruction of forests.

1998 Q 2

- **The river should have:**
- A narrow valley/ gorge
- Regular / reliable water supply
- Large volume of water
- A hard rock film foundation
- Impervious rocks/ impermeable/ non – porous rocks
- Water fall/ head of water/ steep gradient/ slope

- **Fish are caught for human consumption**
- The artificial lake for transportation/ road transport
- The lake provides water for domestic use/ industrial use
- The area is a tourist attraction/ provides recreation/ earns foreign exchange
- Water for irrigation

- Employment/ source of income

1999 Q 3

- Provision of water for domestic use
- Provision for water for irrigation
- The dams serves as bridge across the river
- The dams and the reservoirs are tourists attractions
- The reservoirs have modified the local climate
- Control of floods

- Poor maintenance of the machinery at the powerhouses
- Sitting of reservoirs
- Inadequate capital to purchases spare parts

- Limited number of suitable sites
- Inadequate capital investment
- Scarcity of skilled labour

2000 Q 5

- Water/ tides/Biomass
- Wind/ water/ charcoal
- Drought/ Sun/ Animals
- Steanl/ steam/ Geothermal / Hot springs

- Inadequate capital to invest in coal mining
- The low local demand for coal
- The coal reserves are found for from the potential market/ remote areas
- Availability of cheaper alternative sources of energy/ oil/ Hep
- Poor quality of coal
- Low quantities of coal reserves

2002 Q 8

- Petroleum /oil
- Natural gas
- Uranium
- Coal/peat
- Presence of large volume of water from a river /Lake / large catchments area to provide water to drive the turbines
- Regular / constant supply of water to ensure continuous generation of power
- Hard basement rock to provide a firm foundation for the construction of a dam
- Provide space for reservoir
- Non-porous rock to prevent seepage

- It filters silt to save the other dams which are down stream
- It provides a fishing ground for the local communities
- It provides water for domestic use.
- It is a tourist attraction/reaction
- The dam provides a link role river Tana.
- Water for irrigation

- Provides employment
- Non-exhaustible/ renewable.
- Lean to use / non-pollutant
- Relatively heap
- Easy to use
- Adjustable to any fraction of energy using transformers
- Convenient to use in a variety of ways.

- It would encourage setting up of industries in the rural areas thus stimulating decentralization of industries.
- It would reduce the cutting down of trees and electricity would be available for domestic use
- It would attract/improve social amenities in rural areas reducing the need for people to move to urban areas.
- Most people would invest in the rural areas, which would lead to higher standards of living.
- It would encourage development of horticultural farming / to have ideal storage of perishable of products.

- It leads to closure of some industries
- It led to unemployment /redundancy/early retirement of workers.
- It led to an increase in the cost of electricity / purchase and use of generators
- It led to power rationing. Which slowed down rate of production

2005 Q 3

- S- Masinga (1 mark)
- T – Kindaruma (1 mark)
- The proposed H.E.P station marked
- U- Mutonga (1 mark)

- Wind
- Wood biogases
- Solar
- Geothermal / underground steam

2006 Q 9

- J - Aswan high dam (1 mark)
- K - Akosombo dam (1 mark)
- L - Kariba dam (1 mark)

- It has led to control of floods in the lower parts of river Tana, thus reducing the incidents of loss of life and farm produce in the area.
- The dams are used for generating electricity which is used for industrial and domestic purposes
- The dams are tourists attractions which generates foreign exchange for the country
- The scheme led to the development of industries thus creating employment opportunities
- Some of the dams in the scheme provide water for irrigation thus improving agricultural production

- The reservoirs provide fishing grounds which supply fish to the local people
- It has led to the improvement of roads making the area more accessible
- It has led to the reduction of importation of power, thus saving the foreign exchange
- The dams have provided useful sites for educational purposes

(Any 4 x 2 = 8 marks)

- Coal
- Uranium
- Natural gas (Any 2 x 1 = 2 marks)

- The countries spend more of their foreign exchange on importation of oil, thus negatively affecting other sectors of their economies
- There has been increasing cost of transport causing a rise in the cost of movement of both people, goods and services
- Production costs have increased leading to an increase in prices of commodities thus reducing the demand on the commodities
- Some industries rely on by- products of petroleum have collapsed leading to redundancy and unemployment
- The countries have experienced low economic growth leading to general poverty among the citizens
- It has led to the need to establish/ look for cheaper sources of energy to replace/ supplement the oil
- It has created an awareness on the need to conserve energy
- The countries that have oil potential have started exploring the possibilities of drilling their own oil to reduce/ stop importation.

(Any 4 x 2 = 8 marks)

2009 Q 3

- Presence of hard basement rock
- Presence of large volume of water from River Tana
- Presence of waterfalls / rapids / steep gradient
- Presence of narrow steep sided river valley / deep gorges
- Presence of impervious rock
- Regular flow / constant of R. Tana

- Seasonal fluctuation of water levels in the rivers
- Frequent silting of the reservoirs
- High cost of maintenance of machines
- High cost of transmission of power from remote sites
- Inadequate capital to expand the projects Any 2 x 1 (2 marks)

2010 Q 8a,b,d

- coal
- petroleum
- natural gas (Any 2 x 1 = 2 marks)

- It occurs in huge reserves.
- It produces large amounts of energy compared to other sources relatively small amount of uranium generates large quantities of energy.
- It has a longer lifetime than the other non-renewable sources of energy.

(Any 2 x 1 = 2 marks)

- It refers to a situation where the prices of fossil fuels rise uncontrollably as a result of short supply relative to demand.

(2 marks)

- The increase in the prices of crude oil makes Kenya to spend a lot of foreign exchange in importation. This lowers the foreign currency reserve which brings about unfavorable balance of trade which slows down the rate of economic growth.
- Increase in oil prices triggers the increase in the prices of commodities leading to low standards/high cost of living
- Increases in oil prices leads to increase in the prices of farm inputs which in turn leads to reduced agricultural production/leads to food crisis.
- The high cost of fuels increases the cost of production slowing down industrial growth.
- Oil crisis to scarcity of by-products of oil leading to shortage of raw material for certain industries.
- Increase in fuel prices leads to increased transport costs which trigger price increases in almost all the sectors of the economy.

(Any 3 x 2 = 6 marks)

NB: No credit for effect without crisis.

- Presence of a hard basement rock which provides a foundation for the dam.
- Large volume of water/constant supply of water to enable continuous production of electricity.
- Presence of narrow gorge behind the dam which minimizes the cost of construction of the dam.
- The deep gorge for the riverine head of water.
- Presence of steep rivers gradient/water fall/rapids to provide sufficient hydraulic force to turn the turbines.
- The presence of improper work to prevent seepage. (Any 3 x 2 = 6 marks)

2012 Q3

(a)

- Water
- Oil
- Steam
- Coal
- Wind
- Uranium
- Tides/waves

(b)

- It is a cheap source of energy
- It is an inexhaustible source of energy
- It is clean/environmentally friendly form of energy
- It can be stored for future use
- It can be found everywhere
- It is easy to use
- It has many uses