

(GSA)

Q. (a) Differentiate between Renewable and Non-renewable sources of energy. Give examples of each one of them.

(b) Why nuclear energy is being preferred in developed countries and why are we lagging behind in this important source of energy? (10 marks)

(1) MAIN DIFFERENCES B/W RENEWABLE AND NON-RENEWABLE SOURCES OF ENERGY

Renewable Sources	Non-Renewable Sources
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1) Origin; They are derived from naturally replenishing sources, such as water, wind.

Origin; They are formed from the fossilized remains of the plants and animals over millions of years or from radio-active materials.

2) Availability; They are inexhaustible.

Availability; They become depleted with continued use.

3) Environmental impact
Generally they produce no or less greenhouse gas emission over operation.

Environmental impact; They produce more emission of greenhouse gases over operation.

4) Examples; solar energy, wind energy, geothermal energy etc.

Examples; coal, oil, natural gas, nuclear energy.

(2) NUCLEAR ENERGY; A PREFERRED CHOICE FOR DEVELOPED COUNTRIES

- i) Nuclear energy has high energy density. It powers populated cities of developed countries efficiently with the less use of the fuel.
- ii) Nuclear energy produces less emission of carbon and other pollutants. Thus, it meets the global goal of sustainable development and combats climate change.
- iii) Nuclear energy industries give job to many. It is the source of revenue production and economic growth of developed countries.

- iv) Nuclear energy reduces the dependence on fossil fuels which are subject to price fluctuations and geopolitical instability. Therefore, it give energy security to developed countries.

(3) WHY PAKISTAN IS LAGGING BEHIND IN THIS IMPORTANT SOURCE OF ENERGY

- i) Historical causes; Pakistan focused on developed its nuclear program due to its security concerns. This overshadowed its civilian nuclear programs.
- ii) Limited investment and resources;
The building and maintenance of the nuclear energy programs require extensive capital. Pakistan, a financial constraint country is therefore lagging behind in the nuclear energy.

iii)

Energy mix ; Fossil Fuel dependence;

Historically, Pakistan is used to the fossil fuels for energy generation. Thus, it requires time and planning to come to this energy source.

iv)

International ^{not} regulations and sanctions;

Pakistan, being ~~not~~ a member of NPT, faces obstacles in its civilian nuclear programs as well.
