SUSTAINABLE DEVELOPMENT.

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Sustainable Development.

- Environment factors dominant before Industrial Revolution. Post industrial revolution technology helped man to alter environment conditions.
- Environment balance V/S Economic development.
- Haphazard economic growth failed to realize environment impacts giving rise problems of Pollution and Degradation.
- By 1950s Europeans Nations experiencing effects of pollution on health.

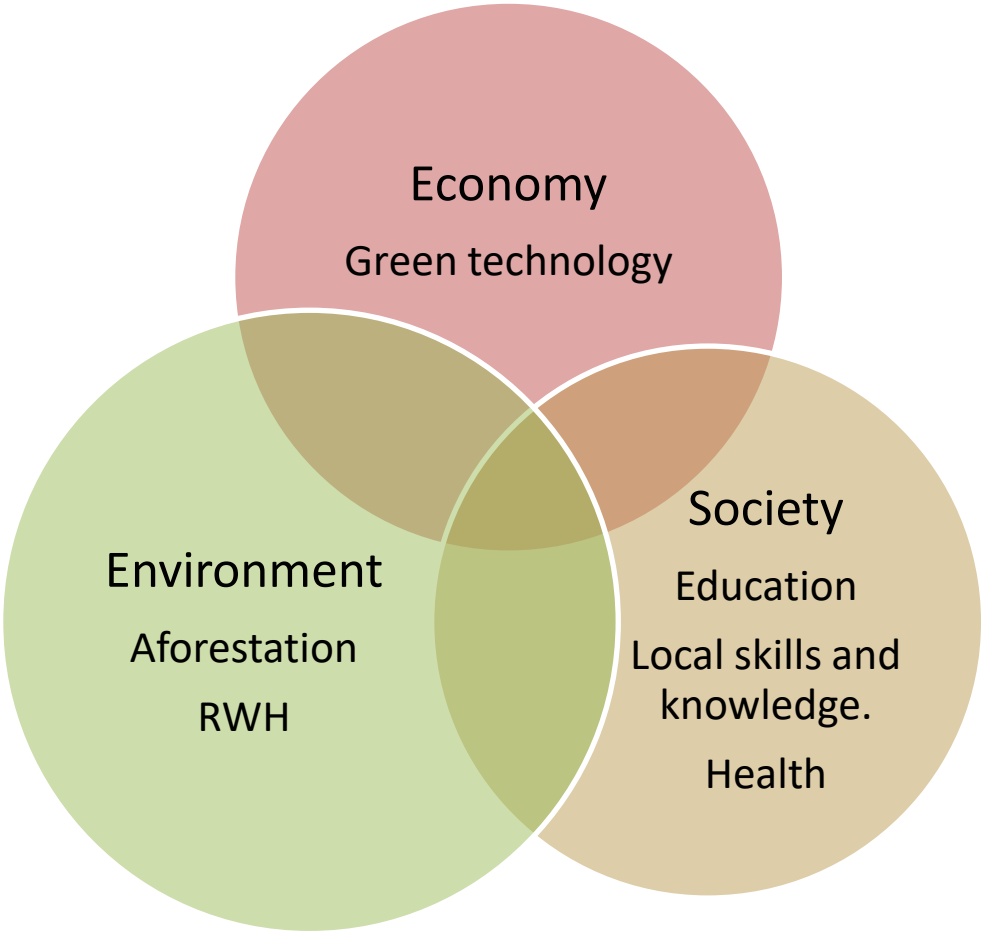

GREEN
REPLENISH
SUSTAINABLE
LOW IMPACT
RECYCLE
EARTH
ORGANIC
CONSERVE
environment
RENEWABLES
Water
TAKE

- 1972 UN Stockholm Conference on Human Development - 5th June WORLD ENVIRONMENT DAY.
- Need to control Pollution and conservation of nature – UNEP.
- Need to balance Environment = Economy.
- Sustainable Development – first introduced in Bruntdland Commission Report.

Definition

- Sustainable Development is the Development that satisfies the Needs of the Present without compromising upon the Ability of the Future to satisfy their needs.

Sustainable Development.



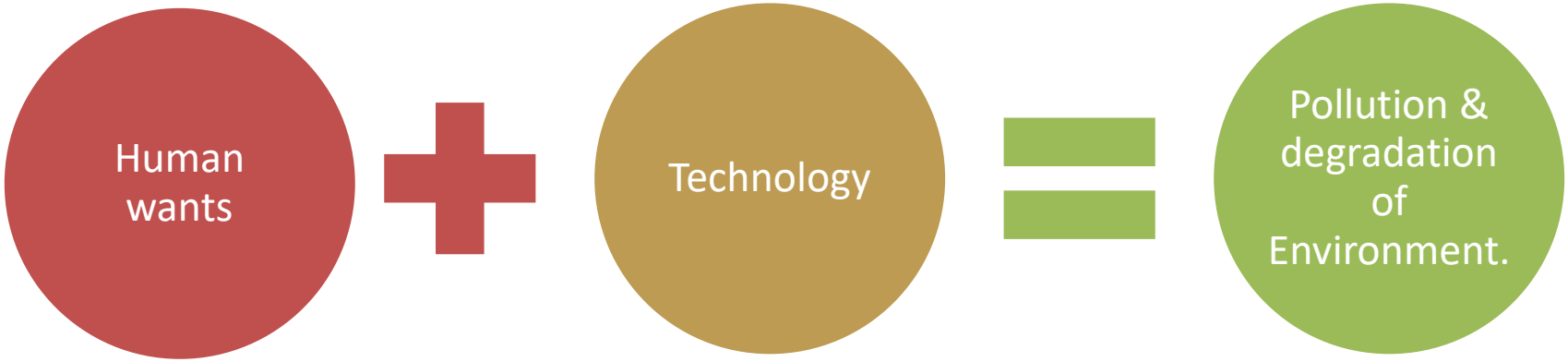
Principles of Sustainable Development

- Harmony with nature. Healthy environment for human welfare. Human survival.
- Control pollution and environmental degradation.
- Conservation of natural resources. 3Rs Recycle, Reuse, Reduce.
- Equality there is one Earth and all UN Nations have rightful share over earth resources. Eg. Oceans.
- Principle of justice- No monopoly of rich nations to exploit natural resources.
- State responsibility over Pollution control and conservation.
- Environmental Awareness and Education.
- Social justice – across all nations, religion, caste, age and sex.

Environmental Management.

- Management ⟹ Planning Tool.
- Management has wide scope and applies to all human activities. E.g. Health management.
- Environment Management not management of the Environment but the management of Human activities which affect the environment.

Need for Envt. Management.



Reflect

- List household activities which affect environment.
- List primary activities responsible for pollution.
- List industrial activities which responsible for pollution.
- Therefore the production sectors have greater responsibility towards controlling pollution.

Corporate Responsibility

- Post 1992 with increasing privatization of Indian economy the role of private sector (Corporate) towards social welfare has increased. CSR, CER.
- Corporate Environment Responsibility (CER) reflects companies approach towards environment protection.
- Given present environment regulations the companies need to integrate environment protection measures into all their operating processes.

Components of CER

- Commitment to environment protection.
- PRO Public Relations Officer- smooth relations with society. Complaints , disputes.
- Interaction and cooperation with Government and PCB Environmental authorities.
- Instill Environmental Discipline amongst all members. CEO to Helpers.
- Cost effective – minimize wastage of resources.

- Optimum use of resources – cut down environment cost. Conduct Environment Audit.
- Adapt corrective and proactive steps towards green production.
- Reduce risk of accidents and mishaps – repairs, training.
- Environment awareness programs. Suppliers and customers.

EM for Engineers.

- Industrial Pollution.
- Adapt and invent ecofriendly technology at all stages of production.
- Knowledge of EM important to boost performance by cutting down environmental cost. Eg carbon credits.
- Knowledge of environmental laws National and International.
- Reduce conflict with Authorities and Society.

- Create environmentally responsible workforce.
- Reduce risk of accidents.
- Conducting Environmental Audit and reporting.
- Initiate scientific research - Solar energy.
- CER help fulfill social obligations. Eg. Plantations.
- Contribute towards protecting local, national and global environment.
- Environment awareness programs.

- Environment Audit : is a review of activities affecting the environment to determine the status of corporations compliance with environmental laws and regulations.

Reflect question.

- As an engineer in your field identify the types of pollution your firm is or may be responsible for.
- Identify various stages at which impact on environment is observed.
- Think of possible ways to avoid pollution.

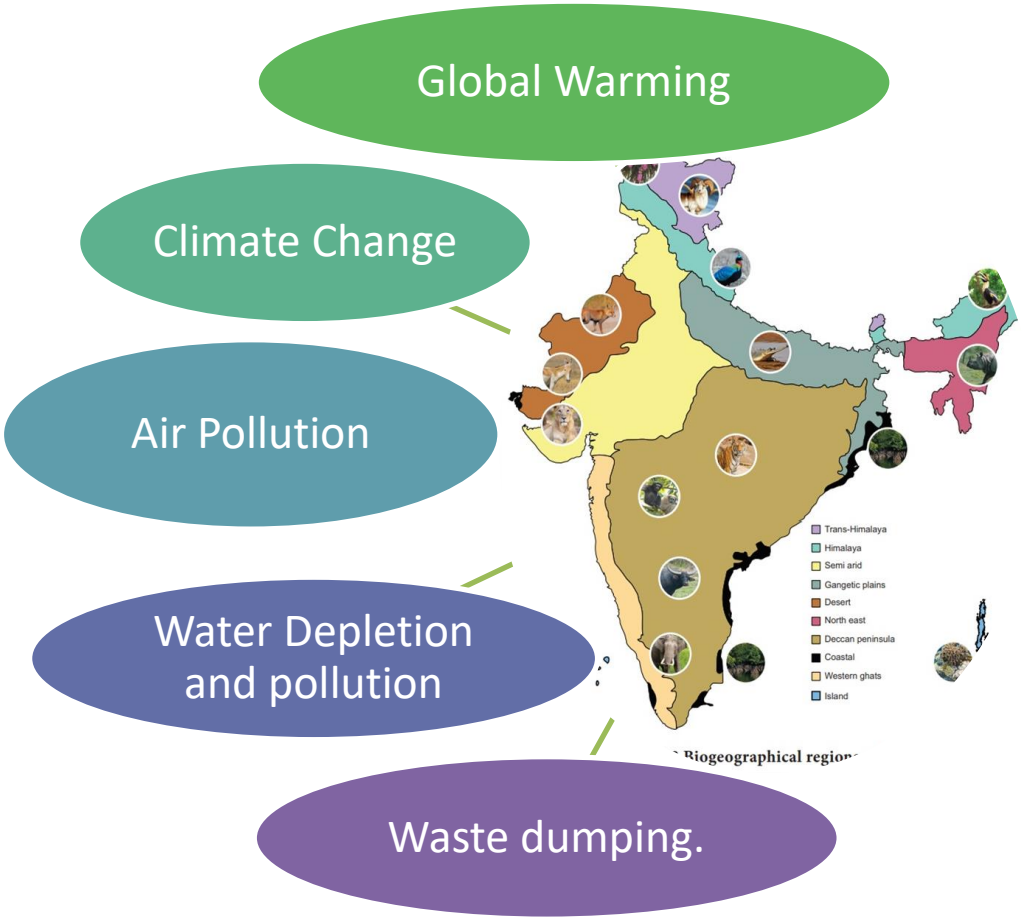
(time 5 minutes).

Environmental Issues Relevant to India.

Why environment protection is needed.

- INDIA – A land of mega-biodiversity
- Tropical and Temperate Bio-geographic regions- tropical, temperate ecosystems.
- Ancient civilizations.
- Population explosion. 1 billion plus.
- Developing economy.

Environmental issues.

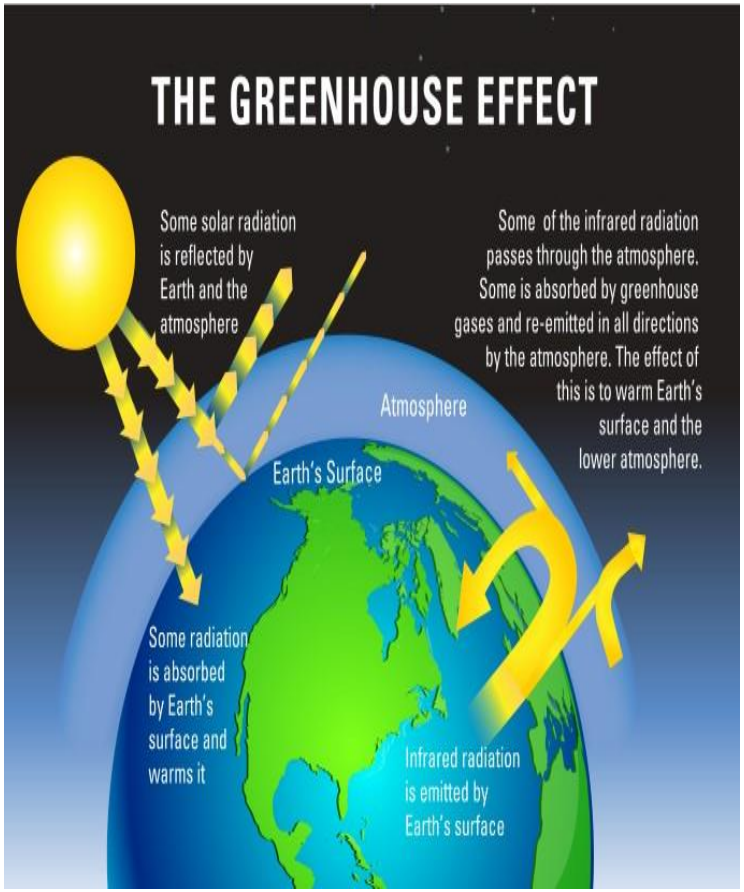


Environmental Issues in India.

- Global Warming: a continuous increase in the average annual temperatures of the Atmosphere. 1990s – rise by 0.02 to 0.05 ◦C
- Normal Atmospheric temperature 18 to 20 ◦C.
- Result of accelerated Green House Effect of the Atmosphere due to increase in GHG. Green House Gases.
- Causes – Deforestation - Carbon dioxide; Industrial Air Pollution; Dairy – Methane ;
- Urbanization with Concert structures ; Burning of fossil fuels.
- Many cities recording highest temperatures of the century.
- Electronic appliances – AC , Refrigerators – decline in O_3.

- Climate Change – Change in the pattern of season and atmospheric events – cyclones, rains, hail stones .
- Climate change is associated with GW.
- Climate change big impact on agriculture production and food supplies. > 50% population still dependent of agriculture.
- Destruction of life and property.
- India – increase in occurrence of floods, cyclones.
- 8% of cropped land destruction annually due to floods.

Green House Effect.



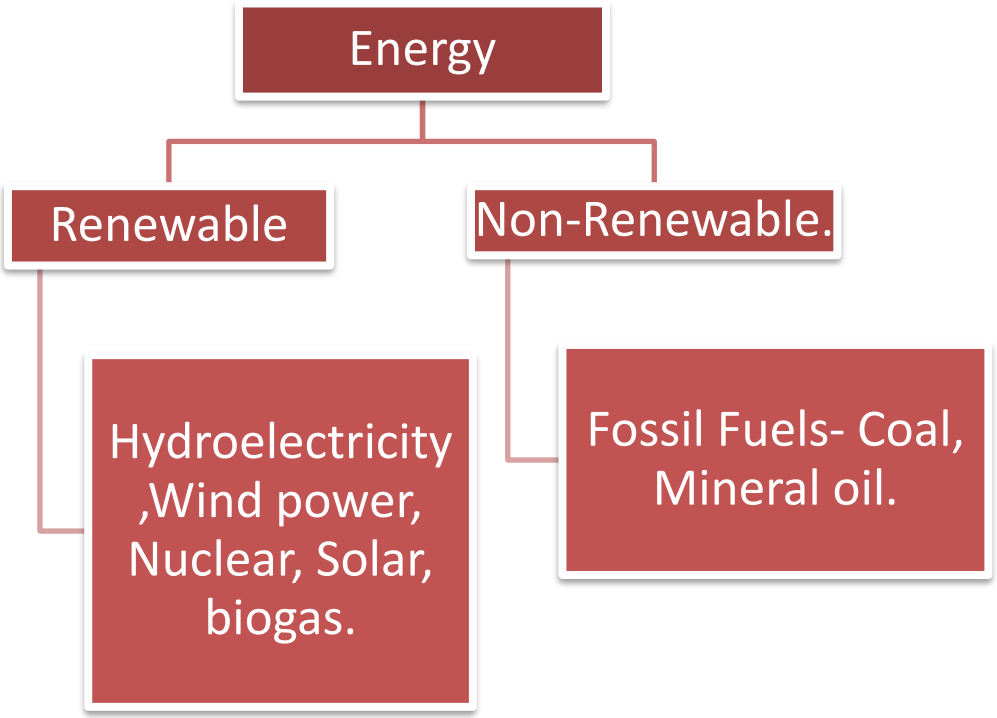
- Industrial Pollution- Developing economy chemical, pharmaceutical, textiles, metal – release pollutants CO_2, SO_2, NO_2 , SPM. Nuclear Pollution.
- Acid Rains - industrial areas. Health Problems, water pollution.
- Water pollution – chemical, food processing, textiles release – bases and acids as effluents. Decline in water quality. Fall in DO. Industries also consume huge quantity of water.
- Threat to aquatic life . Loss of biodiversity.
- 95% Rivers in India are polluted. Yamuna most polluted River in Asia leather industry.

- Agriculture – use of chemical fertilizers, pesticides – soil and water contamination.
- Pump irrigation – depletion of ground water resources.
- Hybrid seeds- health, production.
- Deforestation- to maintain the ecological balance 23 % of land-cover needs to be under forest. India < 19 % of natural forest cover left – reasons : extension of agricultural lands, Urbanization, extension of transport network, mining etc.
- Waste Disposal – Non-biodegradable waste disposal. Includes toxic waste –lead, polythene, mercury, glass, metals etc.
- Mumbai – approx.7000 tonnes /day. Waste generated.

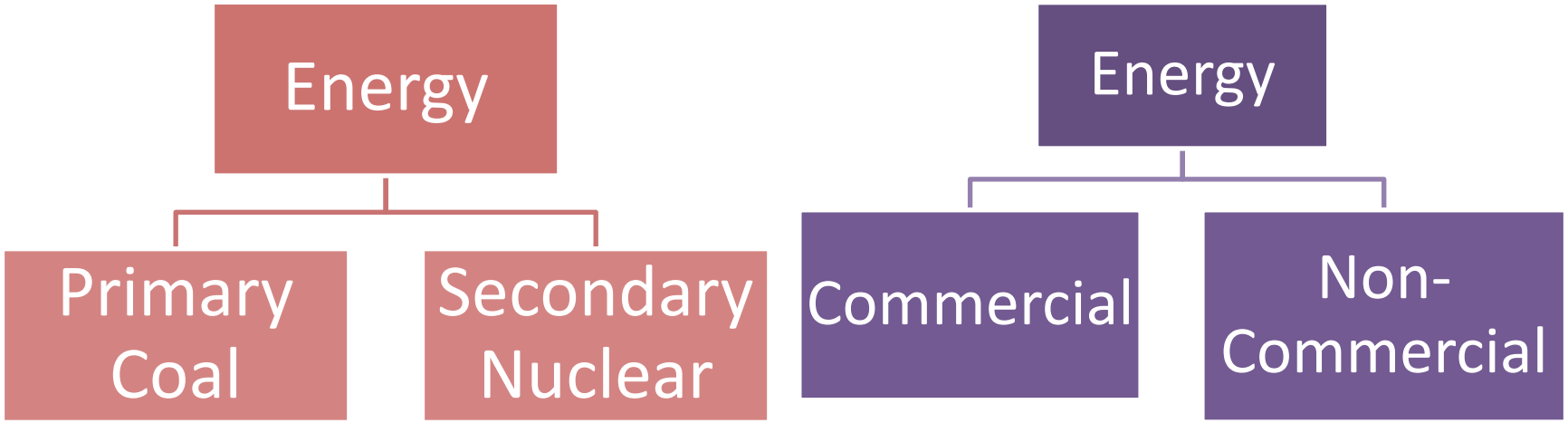
- Population Explosion- 1 billion. Increasing demand on –land, water and biodiversity depletion. Health and nutrition problems.
- Social and political issues – water disputes with neighboring countries and inter-state conflicts over water use. Krishna River water between Maharashtra and Karnataka. Narmada Dam.
- Man- environment Conflict- Water resources, land urban- rural conflict, tribal lands etc. Jaitapur power plant, metro car shed.

Energy scenario.

- Modern development is energy driven. Machine age and age of automation.
- Huge demand for energy resources.



Energy types



- Globalization of world economy – increase in industries and transportation of raw materials and finished products.
- Fossil fuels – 80% of world total energy requirements.
- India -75% Fossil fuels Coal- Thermal power. 21%- renewable energy.
- India -< 10% self sufficiency in energy production.

Energy.

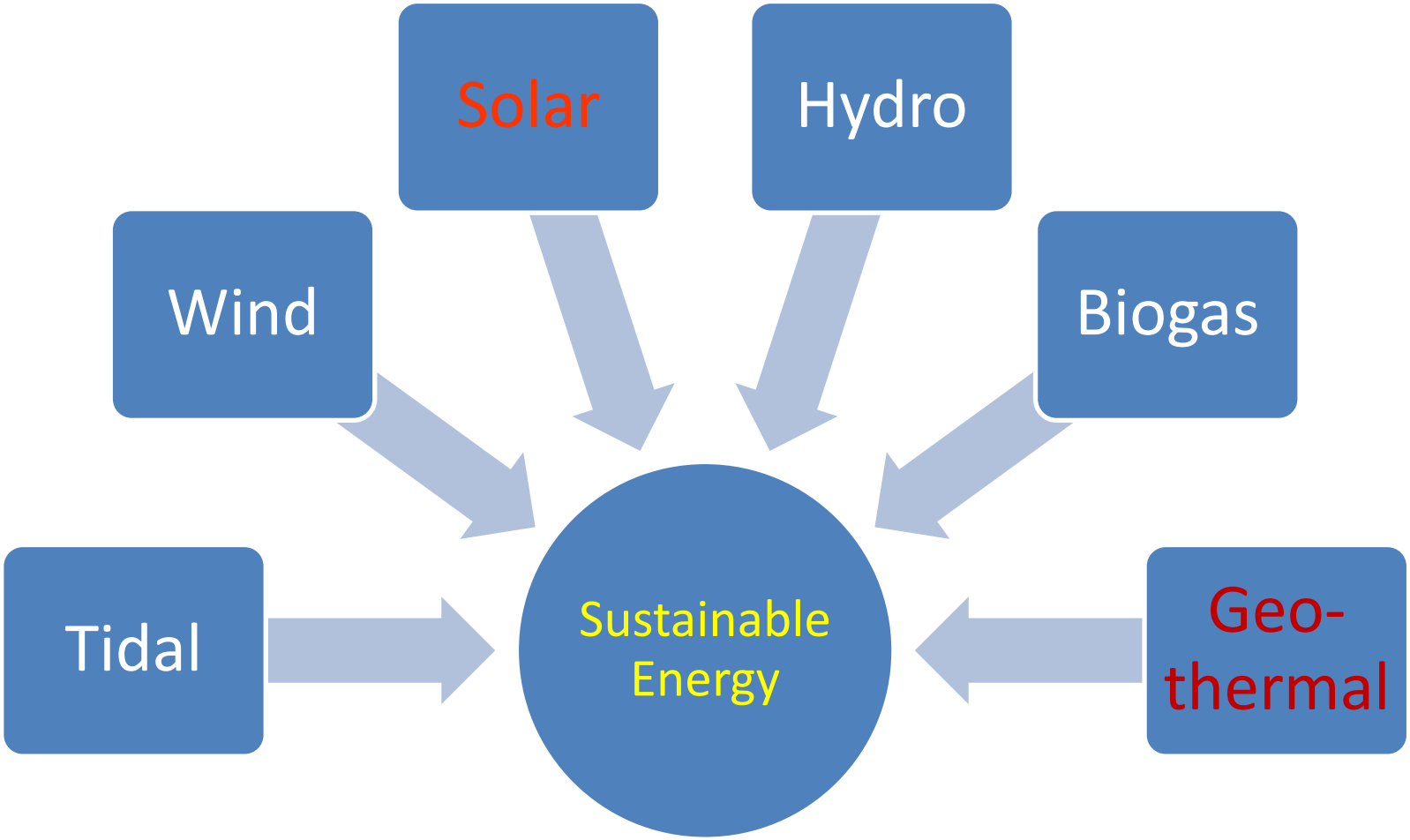
- Fossil Fuels- coal, mineral oil. 50% of total energy production in India.
- Anthracite Coal- 90% C, Bituminous-80%C, Lignite-70% C.
- Oil and Natural Gas – 40 % energy consumption.
- Non- Renewable and Polluting.
- HEP Hydroelectricity- 18 % production. Renewable and non-polluting. India high potential for HEP. Submergence of forest and displacement of people.

- Nuclear Power - nuclear fission or nuclear fussion.
- 2.5% Production. High capacity. India lacks nuclear resources. Depend on imports. Cost factor.
- Radioactive pollution, Thermal pollution.

Given the rate of consumption Fossils will exhausted by 2050. ENERGY CRISIS.

There is need to shift to Renewable Energy resources that are eco-friendly, to save Economic and Environmental cost.

Sustainable Energy.



Reflect

- How can you contribute towards energy conservation at individual and organisational level. Give suggestions.
- Prepare a Energy budget for your Class/ house. Include units of consumption and cost.

Career in Environmental Management (EM).

With increasing awareness about environment protection and increasing regulations to prevent pollution has opened doors of career opportunities in EM.

EM – interdisciplinary – Environmental science, Technology, Management, Organisatonal studies.

Government – Ministry of Environment, Water, Agriculture.

Industries and Corporate – Environment Cells.

Private Consultancy –Project Reports.

NGOs –conservation activities.