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**Alternative Energy Sources – Notes**

**1-Cover**

**2-Alternative Energy Sources**

* Primary energy source for world is **FOSSIL FUELS**
  + Oil, Coal, Natural Gas
  + Fossil fuels are **NONRENEWABLE**
    - Take millions of years to replace
  + There is a finite amount of Fossil Fuels available to us
  + Technology, conservation, and better recovery means will enable us to stretch out the Fossil Fuels, BUT SOME DAY WE WILL RUN OUT!

**3-Alternative Energy Sources**

* HYDROELECTRIC-**WATER**
* SOLAR ELECTRICITY-**SUN**
* WIND POWER
* GEOTHERMAL-earths internal **HEAT** (volcanoes)
* BIOMASS- **PLANT** materials
* TIDAL
* NUCLEAR FISSION

**4-Hydroelectric**

* World’s leading form of renewable energy
* Uses potential energy of dammed **WATER** to drive a turbine and a generator to produce electricity
* Large enough water **SOURCES** are **NOT** readily available to all communities for this technology.

**5-Solar Electricity**

* The technology of obtaining usable energy from the **LIGHT** of the Sun.
* Solar **PANELS** collect sun’s energy & convert it into **ELECTRICITY**.
* **CLOUDY** days & **EXPENSE** of installment are hindrances for this technology

**6-Wind Power**

* Conversion of wind energy into electricity using wind **TURBINES**, or windmills.
* The irregularity of wind **FLOW** can create problems when using wind power

**7-Geothermal**

* Use of geothermal **HEAT** to produce electricity.
* Depends on temperature, **DEPTH** and quality of the water and **STEAM** in the area.
* Fluid injection replenishes water and reheats to a point...
* Dependent on heat source
* Heat and water can be

Depleted with re-injection

**8-Biomass (aka Biofuel)**

* Any fuel derived from recently living organisms or metabolic byproducts.
* Can be produced from any **CARBON** source that can be replenished rapidly e.g. **PLANTS**.
* Biofuels have shown **REDUCTIONS** in the majority of regulated emissions.
* Use of crops for biofuel like **WHEAT**, sugar cane, soy, and **CORN** are raising cost for these crops across the board…

**9-Tidal**

* Electricity generation by capturing the **ENERGY** contained in moving water due to **TIDES**.
* Although not yet widely used, tidal power has potential for future electricity generation and is more **PREDICTABLE** than wind energy and solar power.

**10-Tidal Image**

**11-Nuclear Fission**

* Splitting of large **ATOMS** to release **ENERGY**.
* The amount of free energy contained in nuclear fuel is **MILLIONS** of times the amount of free energy contained in a similar mass of chemical fuel such as gasoline,
* Therefore a very tempting source of energy;
* However, products of nuclear fission are **RADIOACTIVE** & remain so for significant amounts of time, causing a nuclear **WASTE** problem.

**12-Fission Image**

**13-Nuclear Reactors in the World**

**14-Nuclear Reactors in the USA**