|  |  |  |  |
| --- | --- | --- | --- |
| **Chapter 9 Energy Resources Name:** | | | |
| **Renewable Sources of Energy** – resources that are always there, never run out, and/or renew themselves easily  Examples:  **Solar**  **Biomass**  **Water**  **Tidal**  **Wind** **Hydrogen** (uses fuel cells) **Geothermal** | | | |
| **Nonrenewable Sources of Energy** – resources that can be used up and cannot be reproduced in a reasonable amount of time  Examples:  MC900310606[1] **Oil** (**liquid** fossil fuel) MC900334196[1] **Coal** (**solid** fossil fuel – from fossilized plants)  **Nuclear** (Uranium must be mined) **Natural Gas** (**gas** fossil fuel)  **Energy Resources** have many pros and cons. They can be mined, harnessed, drilled out of the ground and created. We need to take care not to use resources without thinking about the pro & cons, as well as conserving. At some point we will run out of places on Earth to find some of our resources.  **Energy Conservation** is the *practice of using less energy*.  **Examples**: turn off lights when you leave a room, turn off TV (etc.) when you’re not watching it, turn your thermostat in your house to 68 in the winter & 78 in the summer to control the temperature, wash laundry in cold water to limit electric or gas water heater use, carpool to conserve fossil fuels, insulate your house better to keep heat in & cold out (or vice versa), replace incandescent light bulbs with compact fluorescent lamps (the curly ones) or LED, unplug appliances that are not being used…can you think of other ways to use less energy?  **Thinking Question:** What are the differences between ***natural* resources** and ***energy* resources**? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | |
| **Type**  **of**  **Energy** | **Advantage (good!)** | **Disadvantage (bad!)**  **Nonrenewable** | **Miscellaneous facts** |
| **Coal**  (solid fuel) | Easy to transport from place to place, burns easily | Pollutes the air when burned, adds to greenhouse effect due to excessive CO2 in the atmosphere, **Nonrenewable** | Solid fossil fuel from the remains of dead swamp plants; factories use, electricity is generated for homes (like @ Plant Bowen) |
| **Oil**  (liquid form of  Petroleum) | Produces large amounts of energy | Pollutes the air, adds to greenhouse effect due to excessive CO2, oil spills are a huge environmental issue  **Nonrenewable** | The U.S. uses about 1/3 of ALL oil produced in the world, but we only have 3% of Earth’s oil supply in our country This means it is an expensive import when we need it. Gas for our cars comes from refined oil |
| **Natural Gas**  (gas fossil fuel) | Used to heat homes & for cooking.  Burns a little cleaner than the other fossil fuels, efficient resource | **Nonrenewable**  Made of methane (a greenhouse gas) & can leak into the atmosphere & cause explosions | It is colorless, odorless & tasteless, so a chemical is added so it can be detected. Forms where coal & oil form. |
| **Nuclear**  (Atomic Energy) | Produces huge amounts of energy | **Nonrenewable**  Produces radioactive wastes that are toxic when something goes wrong! Requires mining of Uranium, which is dangerous | EX: Chernobyl reactor meltdown caused environmental harm & dangers that are still a problem today |
| **Type**  **of**  **Energy** | **Advantage**  **Renewable** | **Disadvantage** | **Miscellaneous facts** |
| **Solar**  (sun heats the atmosphere/area) | **Renewable**  No pollution | Requires sunshine, so it doesn’t work @ night.  Expensive solar panels provide electricity &  some neighborhoods don’t allow these | Passive Solar Heating: The sun heats up the inside of houses through windows & cars in parking lots = free heat ☺ |
| **Wind**  (wind mills/wind farms) | **Renewable**  No pollution | Requires strong and steady winds  Uses noisy generators  Some people don’t want them in their area | Fastest-growing energy source in the **WORLD** to generate electricity in many areas |
| **Hydroelectric**  (power plants @ dams) | **Renewable**  No pollution | Dams can cause harm to the natural environment, requires HUGE flowing water source (not little creeks/streams) | Most widely-used renewable resource  Used to generate electricity for homes/buildings |
| **Geothermal**  (heat from w/in Earth) | **Renewable,** No pollution  The cost of the system is offset by saving money later | Limited availability - it’s not easy to get to everywhere due to the geology of the area  Deep drilling can be EXPENSIVE | In Iceland, most homes & hot water are heated with geothermal energy. |
| **Biomass**  (Biofuels) | **Renewable,** “Carbon Neutral” – doesn’t produce carbon emissions,  Can be made into other fuels | Produces methane gas when it decomposes (this gas traps heat in earth’s atmosphere, so too much is not a good thing) | Can be made from wood, sugar cane, corn, and other crops & garbage  May be used to fuel cars |
| **Hydrogen**  (uses fuel cell) | **Renewable**  Burn cleanly  No pollution | Inefficient right now: Takes more energy to burn the hydrogen than it will produce when its burned | Possible future method to fuel cars in more places. Some countries already use this type of energy & have fueling stations |
| **Tidal**  (rise & fall of water due to tides) | **Renewable**  Consistent & Predictable  Efficient at low speeds  Low cost to run for a long time | Expensive construction  Long distances to the areas needing power  Possible damage from storms  Construction & maintenance challenges | Converts the energy from water movement during tides to electricity |