

A vertical string of five glowing yellow light bulbs is positioned on the left side of the page. The bulbs are of varying heights and are illuminated, casting a warm glow. The background is solid black.

Forest Ridge Elementary Presents...

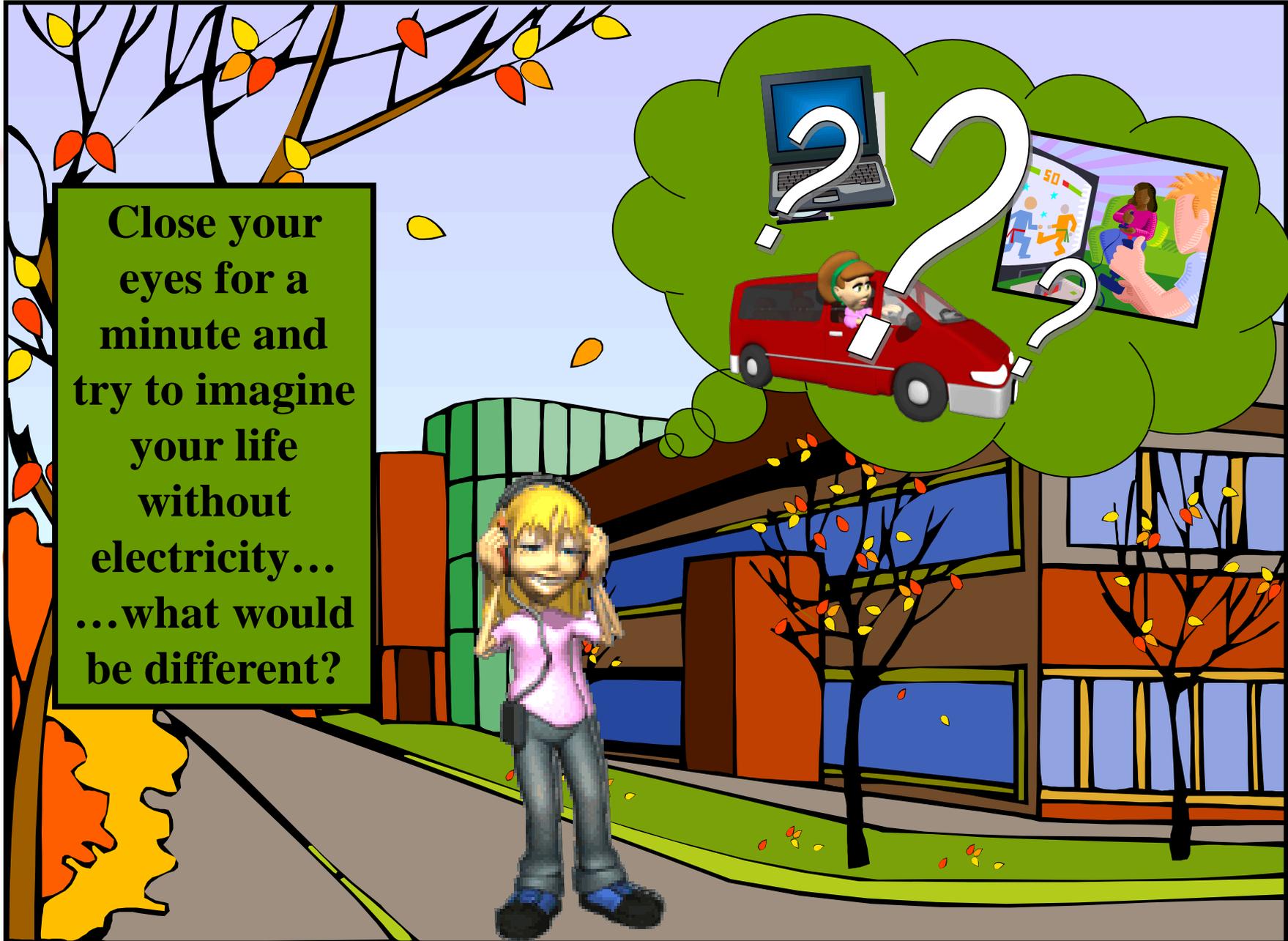


Our Fifth
Reduce
Reuse

“R” Rot
Recycle
Renewable
Repair

Reject
Resources
React

**Close your eyes for a minute and try to imagine your life without electricity...
...what would be different?**





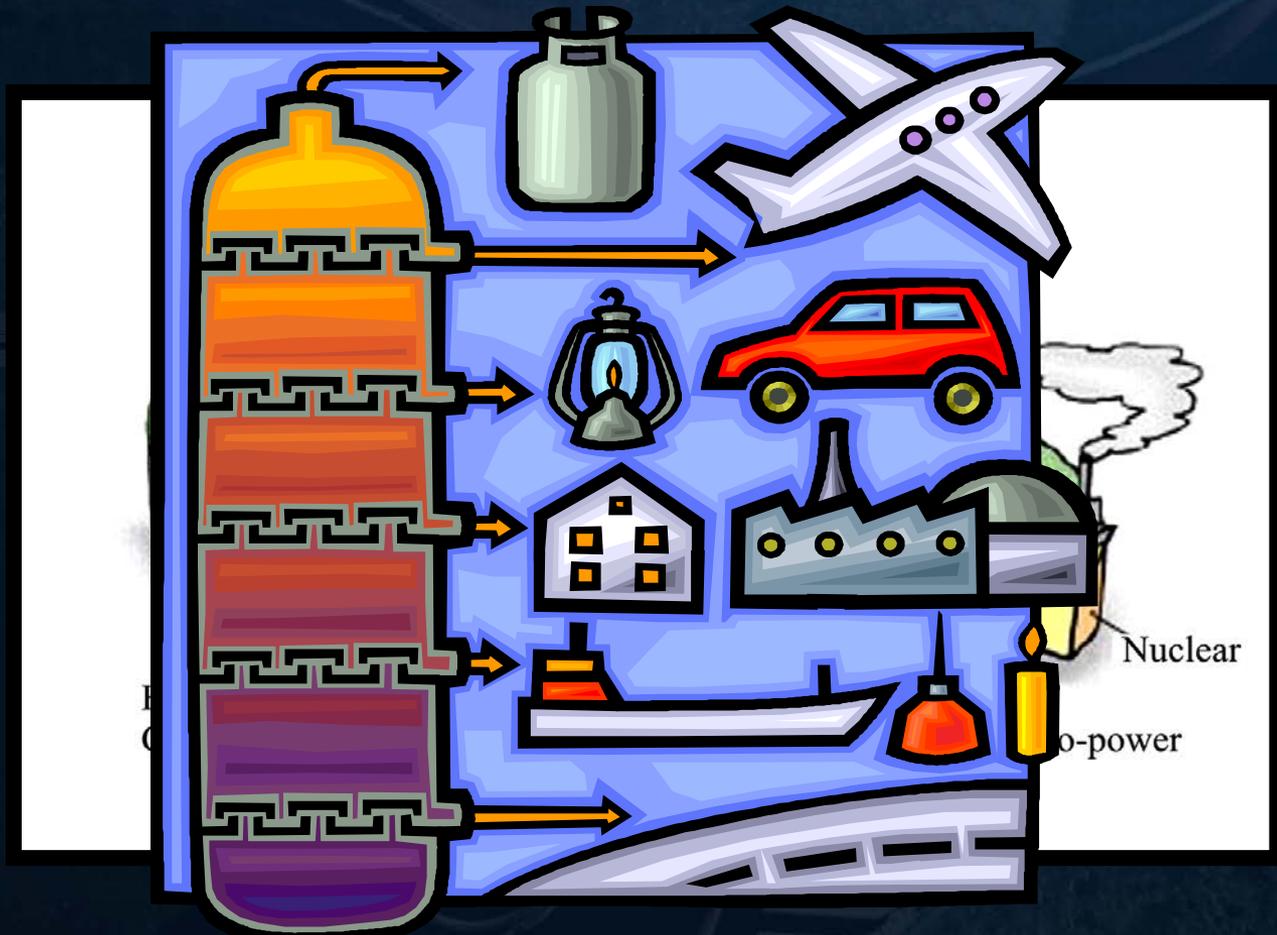
**What if we ran out of electricity
and you needed to cook your
dinner over a fire...**

**Sounds silly,
right?**

**Well, before we learned
how to harness energy,
this was everyday life.**

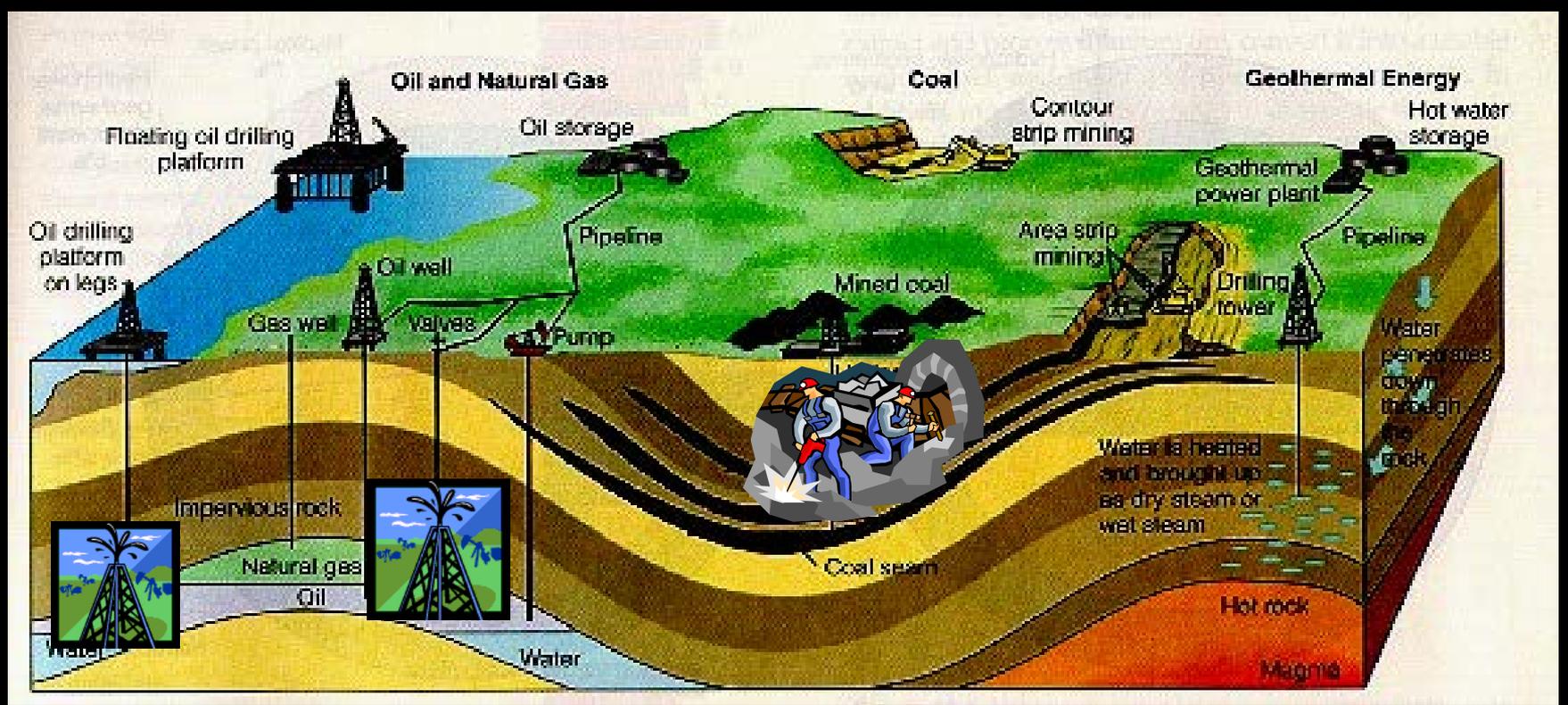


Today most of the energy we use comes from fossil fuels.



Where do fossil fuels come from?

- Decomposed plants and animals.
- Fossil fuels are found underground and take millions of years to create.
- The only way to get to them is by drilling or mining.





Are fossil
fuels
still being
created
today?



Yes...

**but we are
using our natural resources
faster than they are created.**

**They are considered
non-renewable for this reason.**

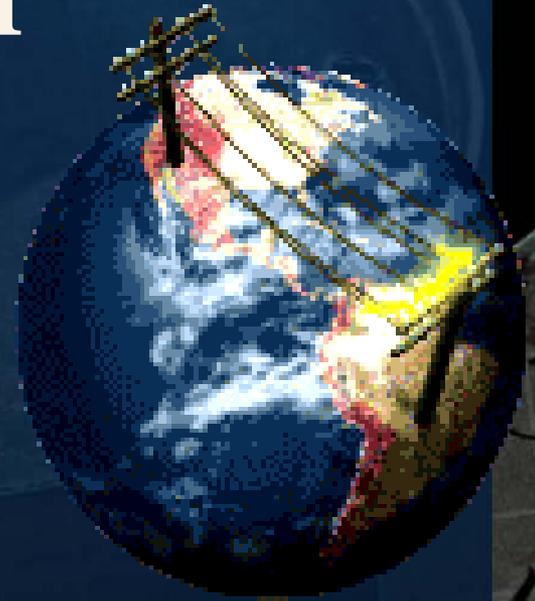
Earth's population is growing at a staggering rate...

If we continue to use energy that is created by non-renewable sources, will we be able to keep up with the demand for energy?



**But so much of our
world depends on
energy...**

...what can we do?



- Conserve energy by only using what we need.
- Reduce the amount of fossil fuels we use to create energy.
- Find other sources of energy that are SUSTAINABLE.

What does sustainable mean?

It describes the way we use our natural resources. We can make choices in the use of our natural resources such as replenishing, conserving or finding alternatives that will meet our current needs and ensure future generations will be able meet *their* needs as well.

Fortunately scientists
have already identified
alternative energy
sources.

They are called
renewable
energy sources.



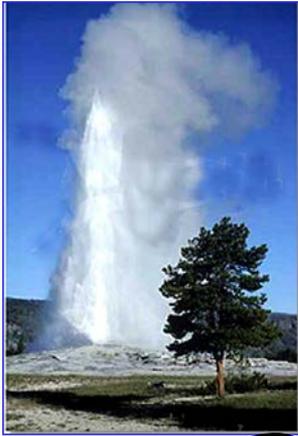
Renewable energy is...

... created from sources that are constantly being generated.



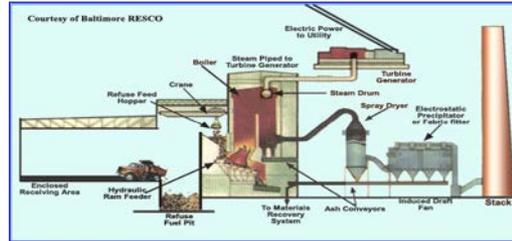
Clean Renewable Energy

What are some types of renewable energy?



Geothermal

Ocean



Energy from Trash

Wind



Hydropower



Biomass

Solar Power



Fuel Cell



Renewable Energy Resources

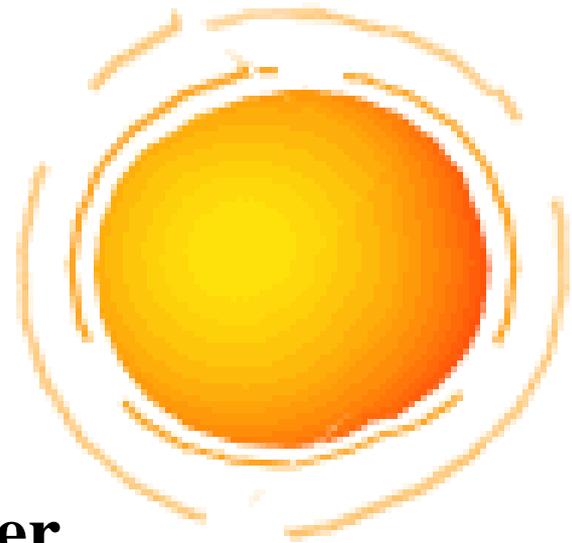


Solar Energy

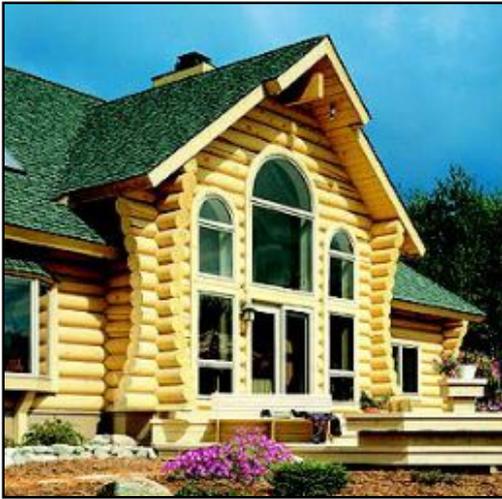
The sun creates energy that can be used to warm and light our homes, heat water, and provide electricity .

**There are four main methods
for creating solar energy.**

- Solar Heating**
- Photovoltaic Energy**
- Solar Water Heating**
- Solar Thermal Electric Power**



Solar Heating



- Homes with south-facing windows let the sunlight in so that heat absorbing tile or brick flooring can absorb the sun's heat during the day. That heat is then released at night.
- This is also called Passive Solar Heating.

Photovoltaic Energy

The sun's energy can be made directly into electricity using photovoltaic (PV) cells, sometimes called solar cells.



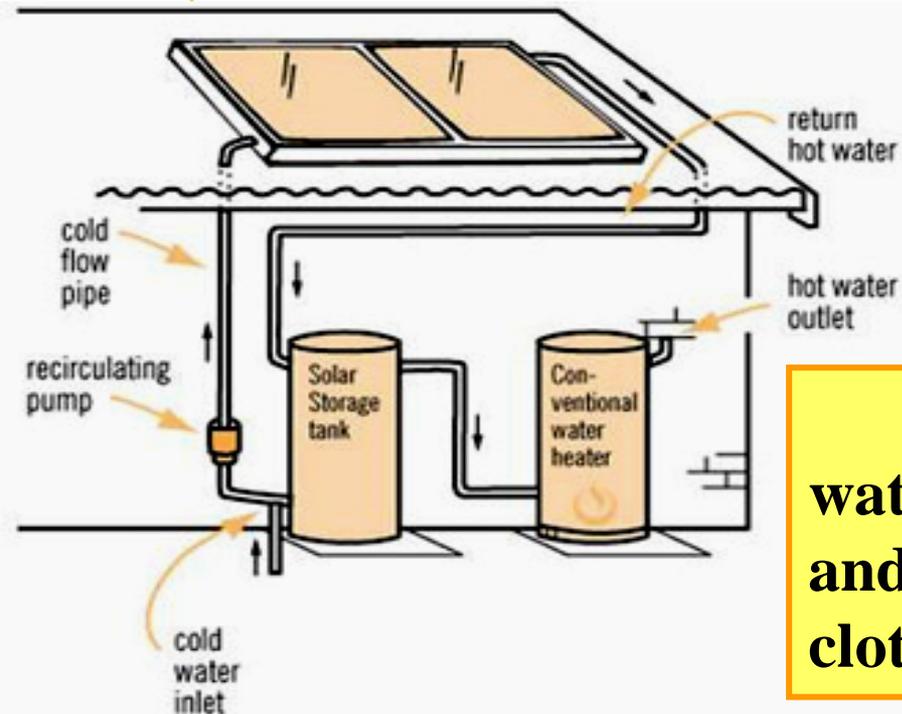


Solar Water Heating

Using a solar collector water is heated by the sun and then pumped into a insulated storage tank.



© 2004 ESTIF/Solarwatts

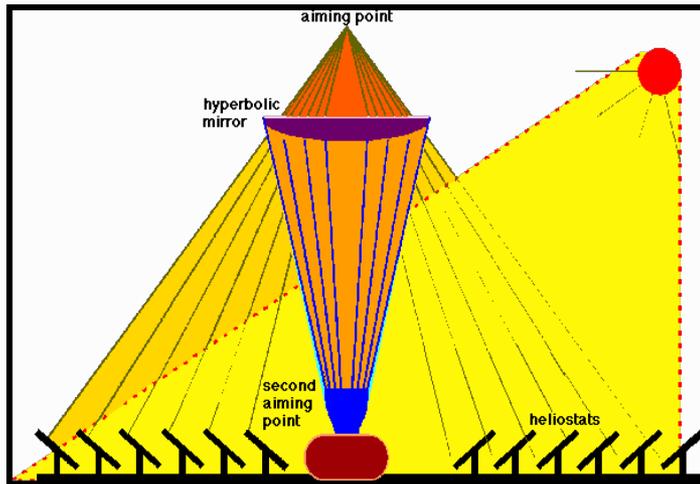


From the storage tank, hot water can be pumped into our homes and used for showers, washing clothing or in our dishwashers.

Solar Thermal Electric Power



Solar thermal systems focus sunlight to produce heat, which then boils water to make steam.



- The steam turns a turbine, made of several rows of blades, mounted on a large shaft.
- Then an attached generator makes the electricity.

Are there any problems with Solar Energy?



Yes, some climates have less sunlight and PV systems don't work well on cloudy days.

Wind Power

Wind turbines are similar to wind mills built long ago, but now have fewer blades.

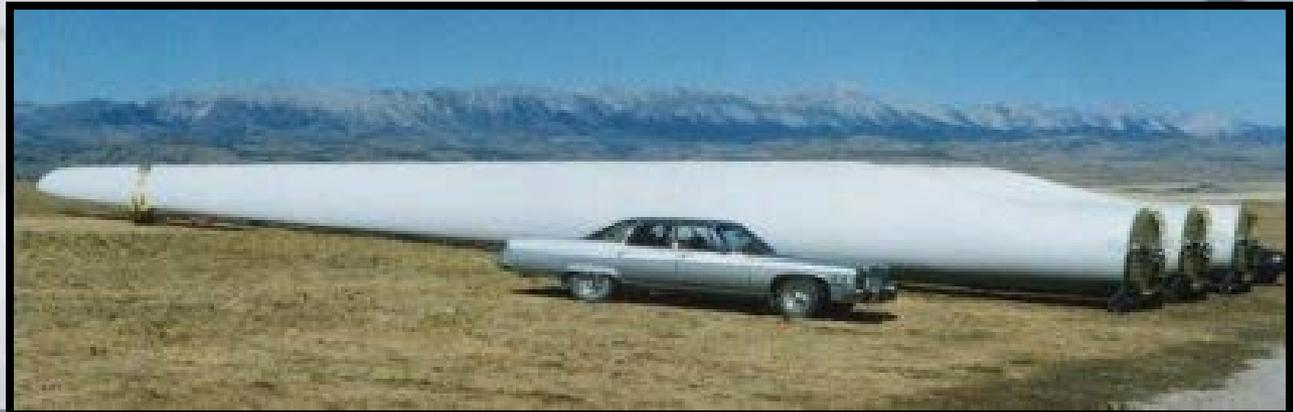
Today's wind turbines have just two or three blades that turn when the wind blows.



How big is a wind turbine?

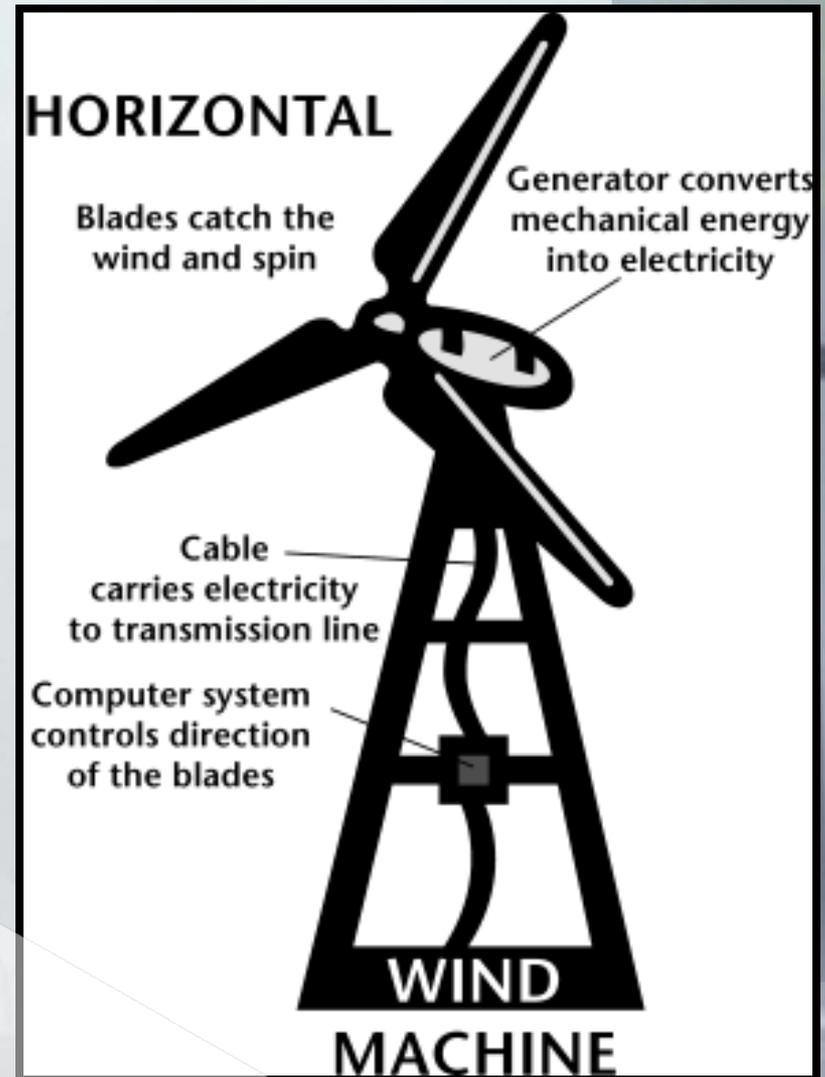


- The blades on a wind turbine are also much longer than those seen on wind mills.
- Wind turbine blades can be up to 82 feet (25 meters) long.



How do they work?

- The blades drive a generator which produces electricity, much like steam turbines.
- The longer the blades, the more electricity can be generated.



Wind Farm

Large groups of wind turbines, called wind farms, or wind plants, can be connected to electric utility power lines and provide electricity to many people.



Are there any problems with Wind Power?



To produce the most electricity,
wind turbines must be located
in areas where wind blows
at a constant speed.

**No Wind,
No Power**

Geothermal Energy

Energy from heat within the earth

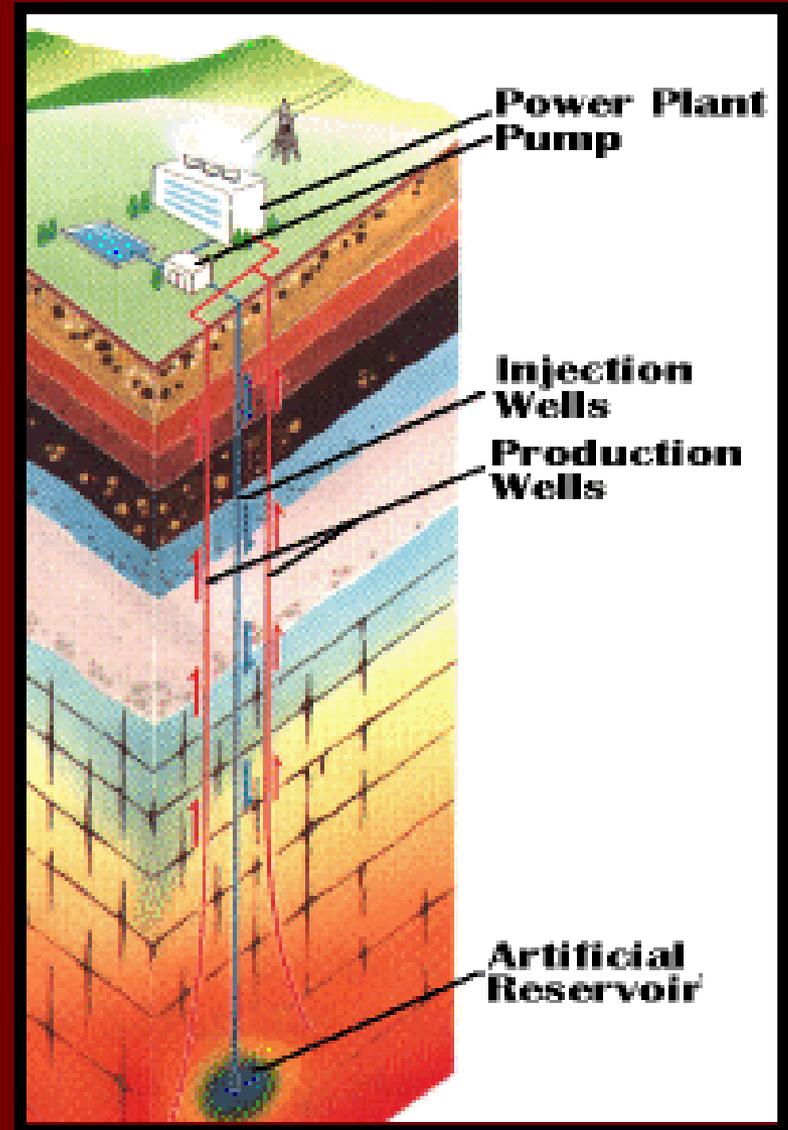


Magma heats pools of underground water, known as geothermal reservoirs, which can get so hot they boil producing steam.

Openings in the earth's surface may allow boiling water to rush out, forming a hot spring or geyser.

How can we capture this energy?

By drilling down into these underground pockets of water, we can make use of this resource either directly or use it to generate electricity with a steam powered turbine.

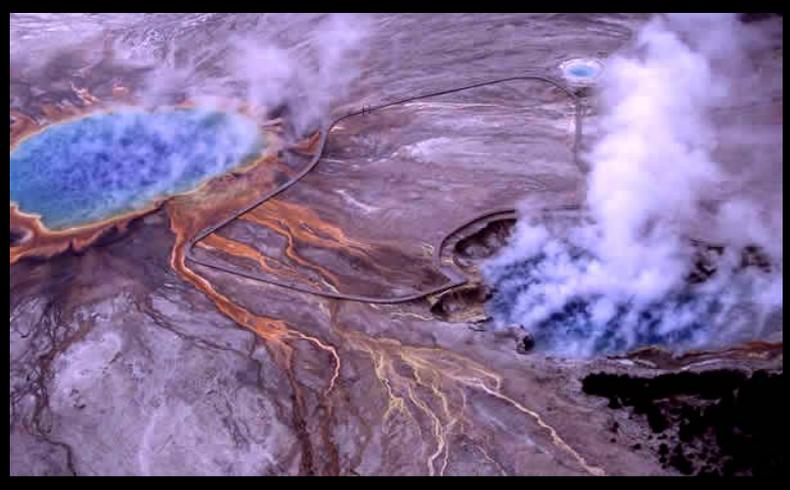


Problems with Geothermal

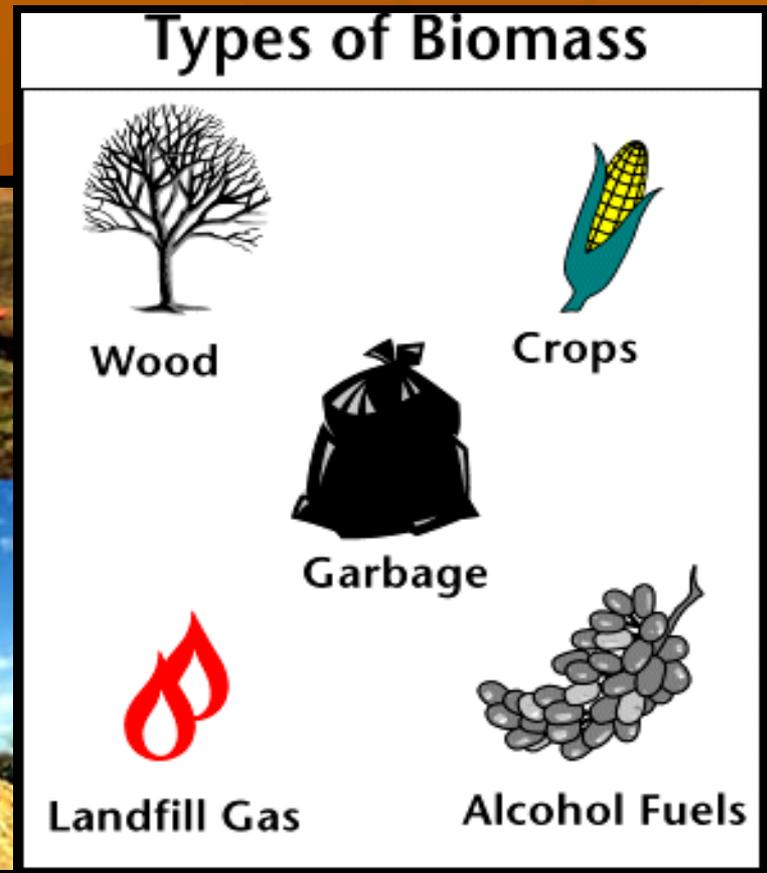
Similar to fossil fuels, we could run out of this resource or use it faster than it can replenish itself.



Water from geothermal reservoirs often contains minerals that are corrosive and polluting.



Biomass



Biomass is the sun's energy which is stored in plants and trees.

How can we use biomass to make the energy we need?

There are three ways to use biomass.



1. It can be burned to produce heat and electricity.

2. It can be changed to a gas-like fuel such as methane.

3. It can be changed into a liquid known as biofuels.



Biomass as a Liquid

Biomass can be directly changed into a liquid fuel, and someday may supply most of our fueling needs for transportation.



Diesel fuel can be replaced by biodiesel which is made from vegetable oil.

Problems with Biomass

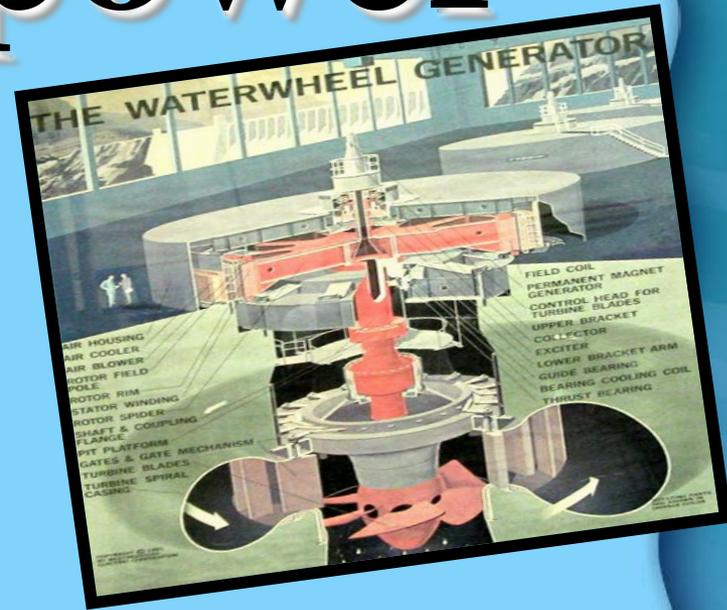
We will need to manage our use of this resource or we might consume it faster than we produce it.



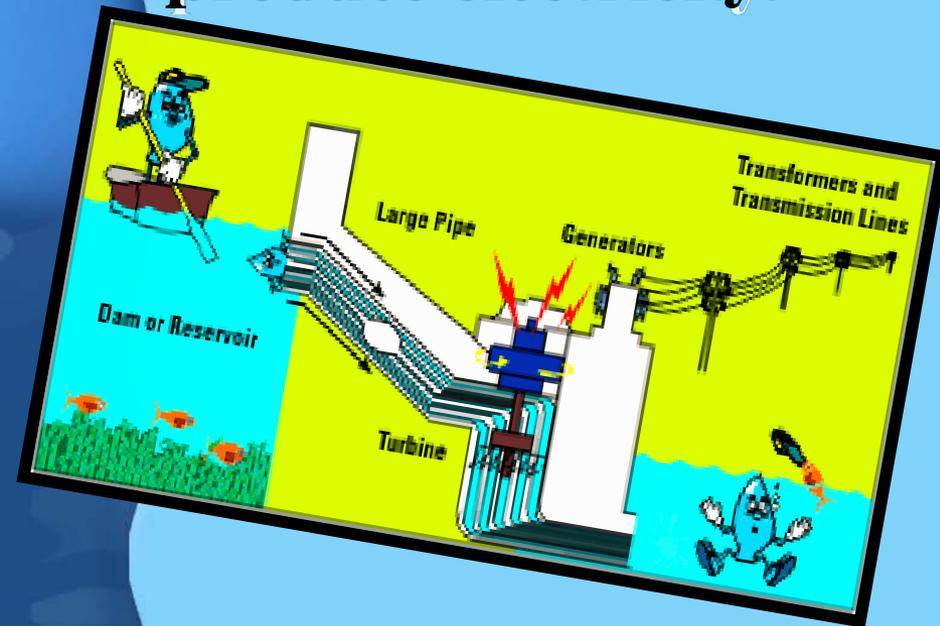
As with any fuel, biomass creates pollutants when it is burned or converted into energy.

Hydropower

Water captured from rivers and streams can be released through turbines, connected to generators that produce electricity.

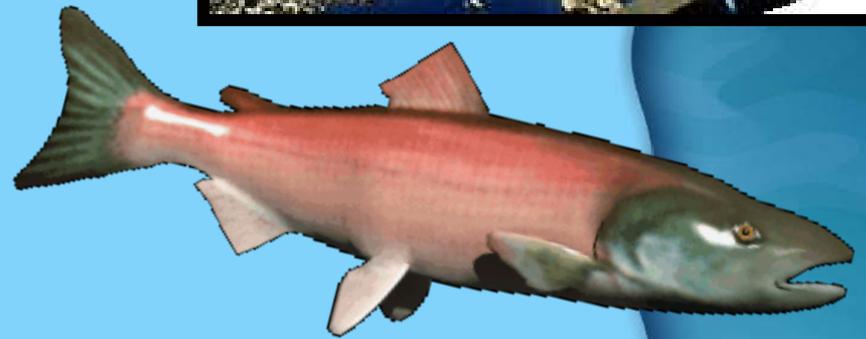
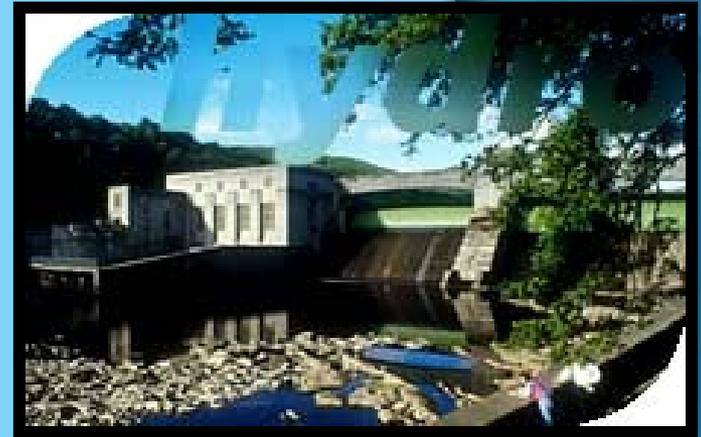


Hydropower is currently one of our largest sources of renewable power, generating about 10% of the United States' electricity.



Problems with Hydropower

When we build dams on rivers, we change their ecology.

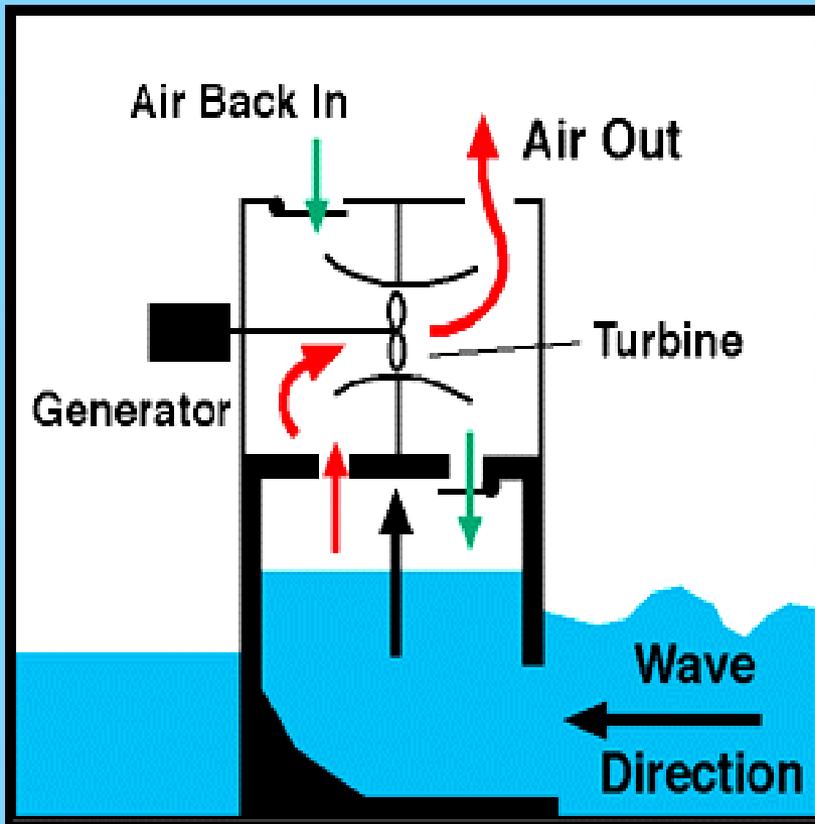


- Water above the dam stays warmer than below.
- Fish are often blocked from their spawning ground and die.

Ocean Waves



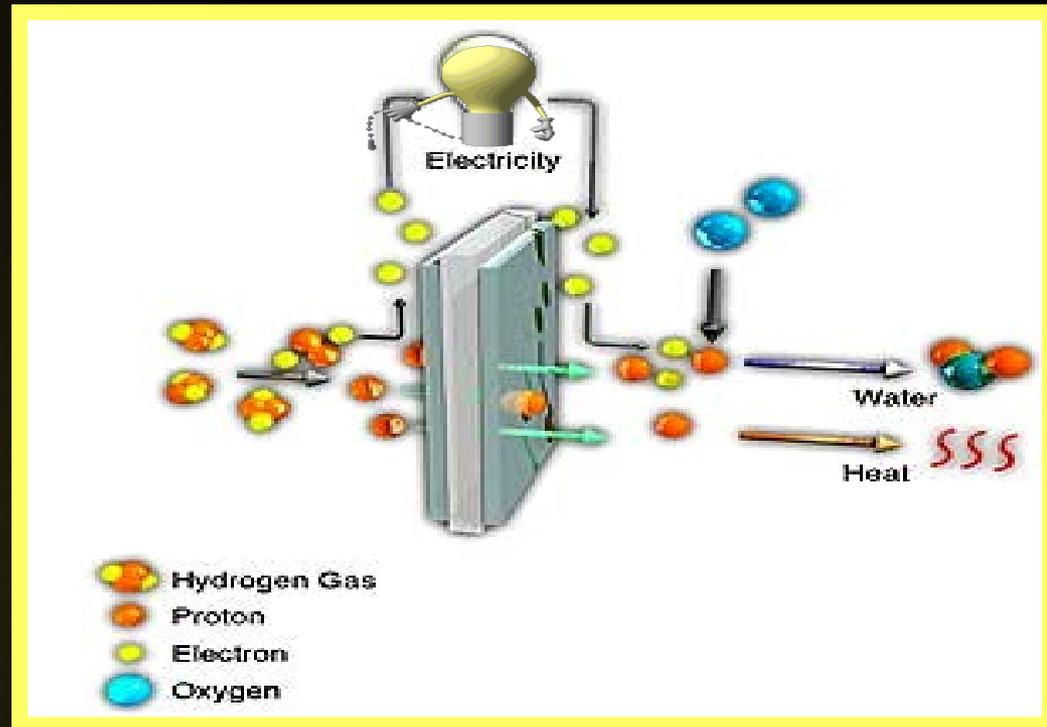
Ocean Waves Can Make Energy

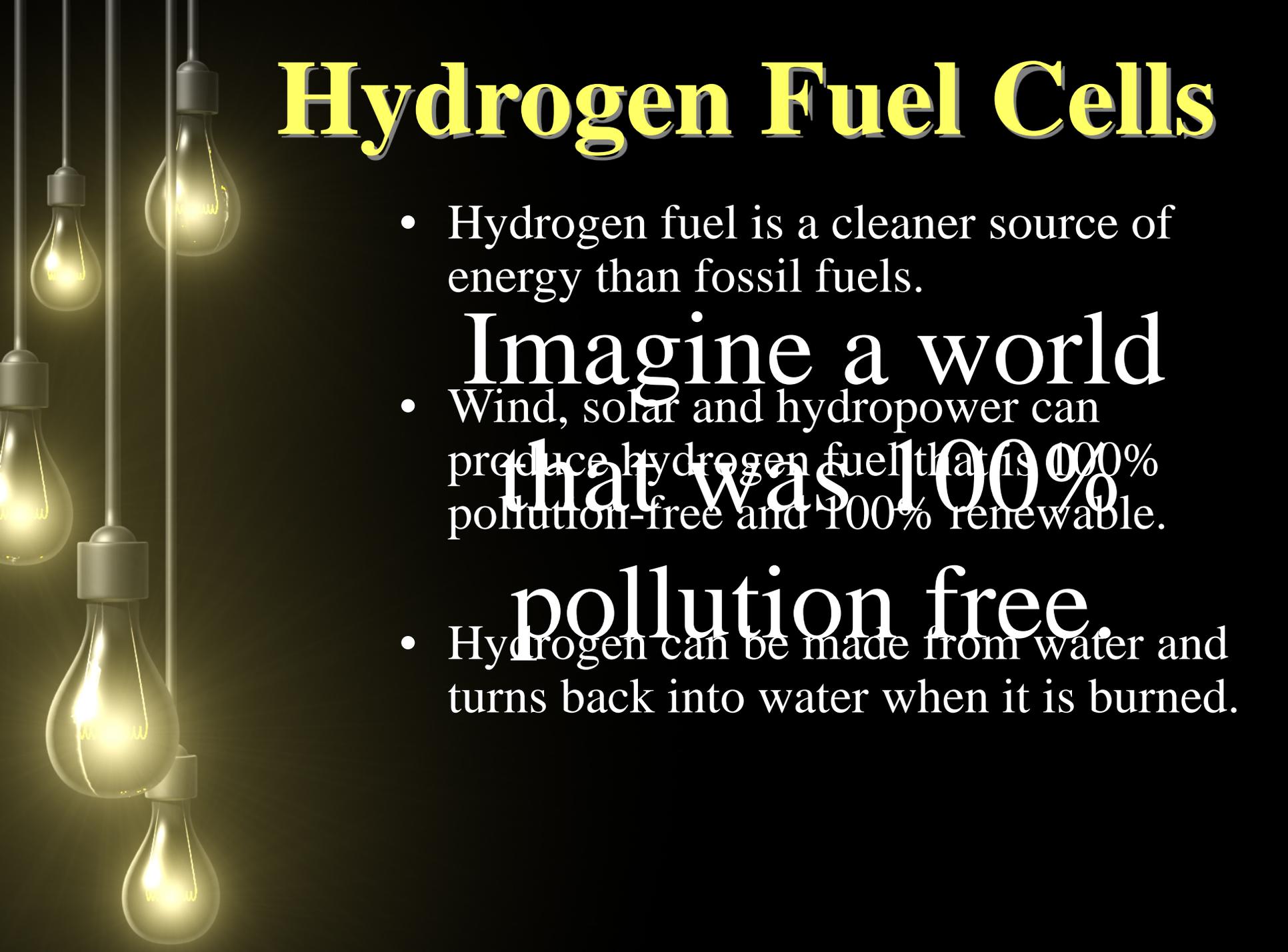


This diagram shows how the power of ocean waves can be used to turn a turbine which generates electricity.

Fuel Cells

A fuel cell converts hydrogen and oxygen into water to produce electricity.



A decorative background on the left side of the slide features several glowing yellow light bulbs hanging from thin black cords. The bulbs are arranged vertically, with some slightly offset from each other, creating a modern, minimalist aesthetic. The background is a solid dark color, likely black or dark grey.

Hydrogen Fuel Cells

- Hydrogen fuel is a cleaner source of energy than fossil fuels.

- **Imagine a world** that was 100% pollution-free and 100% renewable.

- **pollution free.** Hydrogen can be made from water and turns back into water when it is burned.

Energy from Trash

- Municipal solid waste (or garbage) can be burned to generate electrical power.



- We can also release methane gas which is produced when food and waste decay in landfills.

- Methane gas can be burned, producing steam for moving a turbine which generates electricity.

Problems with getting our Energy from Trash

**Burning municipal solid
waste can produce toxic ash.**



PHOTO: ROBERT R. BOWERS



What can you do to help?

- Choose RENEWABLE ENERGY sources instead of fossil fuels.
- Apply what you have learned today and become a BETTER CONSUMER of energy.
- Help SPREAD THE WORD, share what you have heard with someone you know today.



**Knowledge is POWER,
together we can make a
difference and build a
healthier, cleaner,
WORLD for tomorrow!**

POWER

Credits

*Information used in this PowerPoint
was obtained from
the following sources on 2/20/06.*

- http://www.eere.energy.gov/kids/learning_renewable.html
- <http://www.wattsonschoools.com>
- <http://www.animationfactory.com>

*This PowerPoint was designed by
Amy Bowerly*