



TOMORROW'S PLANET

A newsletter for **kids** who want to make our world a better place

Explore, enjoy and protect the planet

Issue #16

The True Cost of Coal *Is energy from coal worth the price?*

Coal provides over half of the electricity in the United States. It is also arguably our dirtiest source of energy. The burning of coal contributes to global warming. It pollutes our air and harms our health. And, mining coal destroys mountains and contaminates drinking water.

So, what is coal and where does it come from? Coal is a **fossil fuel**, like oil or natural gas. Because coal takes millions of years to create, it is considered a **nonrenewable**

energy source.

The energy in coal comes from energy stored by plants that lived hundreds of millions of years ago, when Earth was partly covered by swampy forests. As the years passed, plants would die and sink into the swamp. Then they were covered by layers of water and dirt, trapping the energy of the dead plants. The heat and pressure from the top layers helped the plant remains turn into what we now call coal.

Today, coal is burned in huge power plants to create electricity. So, every time you turn on your television, surf the internet, or plug in your iPod, chances are you are using coal.

When coal is burned to make electricity, it produces a large amount of carbon dioxide, one of the main **greenhouse gases**. When carbon dioxide gets in our atmosphere, it traps the heat of the sun, making Earth grow warmer.



Coal power plants are also one of the largest sources of air **pollution** in the United States. The soot that comes from burning coal can increase the chances of **asthma** attacks and permanent lung damage, and coal mining can be very destructive as well.

There is a large amount of energy stored in coal. However, releasing that energy adds to the problem of global warming and pollutes our air and water. Cleaner, renewable energy sources, such as wind and solar energy, may be better for our health and our planet.

Content objective: Grade 6 Earth Sciences: Resources

Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept:

Students know different natural energy and material resources ... and know how to classify them as renewable or nonrenewable.

Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Green Energy

Renewable sources for clean, safe power

Energy doesn't have to come from polluting power plants. There are clean, safe, and affordable sources of renewable power.



Wind Energy

Propeller-shaped blades capture the kinetic (moving) energy of the wind, and a generator converts the mechanical energy of the moving blades into electricity.



Solar Energy

It is 93 million miles away. Yet, the sun is still the primary source of all the energy on Earth. The energy in fossil fuels originally came from the sun. Its uneven heating of our planet produces wind. The sun powers the water cycle which makes hydroelectric power possible. Solar energy can be used to cook food, heat water, and to generate electricity.



Geothermal Energy

Geothermal energy is heat from within the Earth. The same heat that explodes from volcanoes and geysers can be used by us. We can recover this heat as steam or hot water and use it to heat buildings or generate electricity.



Biomass Energy

Plants absorb energy from the sun through photosynthesis. The energy contained in the plants can be released to produce heat and electricity.

Words to know

Asthma: Asthma is a condition where airways in the lungs become inflamed, causing coughing, wheezing, shortness of breath and tightness in the chest.

Fossil fuel: A fuel such as coal or oil formed in the earth over millions of years from plant and animal remains.

Greenhouse gases: A greenhouse gas is any gas that absorbs and traps heat in the atmosphere. Greenhouse gases include methane, carbon dioxide, and others.

Nonrenewable resource: A resource (such as coal or oil) that runs out because it is used up faster than it can be replaced.

Pollution: The introduction of harmful substances or products into the air, water, or soil.

Mountaintop Removal — *Blowing up mountains for coal*



Photo by Mark Schmerling

Which picture do YOU like better?



Forested mountains in places like West Virginia sometimes have coal buried inside. To get to the coal, mining companies use explosives to blow off the mountaintops. The rocks and soil left behind are dumped into nearby valleys and streams.

Habitat that was once home to bears, foxes, porcupines,

and other wildlife is destroyed. People nearby can be harmed as well.

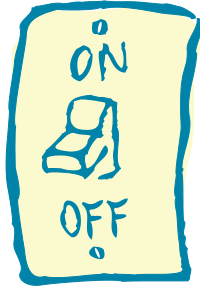
Mountaintop removal mining fills streams with mining waste. This waste can make the water undrinkable. It can also cause increased risk of flooding.

Learn more at www.sierraclub.org/mtr

Four things YOU can do to save energy

1. Turn it off!

Turn out the lights, turn off the television, and don't forget to shut down the computer when you're not using them.



2. Reduce, reuse, recycle!

When you recycle, you help save natural resources like trees, and you cut down on energy use and pollution. It takes energy to make new things.

3. Get outside! Riding your bike or taking a hike doesn't require any electricity, and the exercise will do you good!

4. Visit Energyhog.org!

The Alliance to Save Energy has some fun activities and games that will teach you how to use energy wisely.

www.energyhog.org

Be a renewable energy detective!

Renewable energy sources are power sources that won't run out. They are constantly being renewed through natural processes. Take a look at the types of energy below and see if you can classify them as **renewable** or **nonrenewable**.



Solar energy (power from the sun)

Coal power (energy from burning coal)

Wind energy (power from the wind)

Geothermal energy (power from Earth's core)

Nuclear power (power from splitting uranium atoms)

Wave power (energy from ocean waves)

Natural gas energy (power from burning natural gas)

Hydroelectric energy (power from falling water)

Biomass energy (power made from plants and animal waste)

Oil power (power from burning oil)

Use these **CLUES** in your detective work:

1. Is the energy source a fossil fuel? If the answer is YES, the power source took millions of years to create and can't be renewed as quickly as it's created. It must be nonrenewable.
2. Does the energy come from something that will always be around? If the answer is YES, it must be renewable.

Get your evidence together, and see if you qualify as a renewable energy detective!

Ask your parents to help save energy too!

Talk to your family about ways to save energy. Cutting energy use at home will save money on the electric bill and help save the environment!

1. Use the cold water cycle to wash clothes and always do full loads of laundry.
2. Hang clothes to dry instead of

using the energy-sucking dryer.

3. Look into tax credits for energy-efficient home improvements. Learn how at www.energystar.gov.
4. Turn down the heat at night and bundle up instead.
5. Use energy-efficient light bulbs, such as compact fluores-

cents, instead of high energy incandescent bulbs.

6. Have a relative read you a story instead of watching television.
7. Take shorter showers.
8. For more ideas, visit www.sierraclub.org/energy/efficiency

Tell us what you're thinking!

Draw us a picture of actions you're taking to reduce your energy use at home or at school! If we print your drawing, you could get a **FREE** Sierra Club backpack, hat or children's book. Go ahead — tell the world what's on your mind!

Name _____ Age/Grade ____ / _____

Submissions become property of the Sierra Club and may be used without limitation or restriction.



What the Sierra Club is doing to move beyond coal to a clean energy future

The Sierra Club is working to transform our energy future by:

- 👉 Encouraging a move to green, renewable energy sources such as wind and solar power.
- 👉 Working to promote energy-efficient homes and buildings that eliminate global warming emissions, reduce utility bills, and allow us to move beyond reliance on dirty fuels.

👉 Moving college campuses beyond coal to 100% clean power.

👉 Raising awareness of the damage done by mountaintop removal mining and highlighting the health risks posed by coal plants.

To learn more go to:
www.sierraclub.org/coal
www.sierraclub.org/energy

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