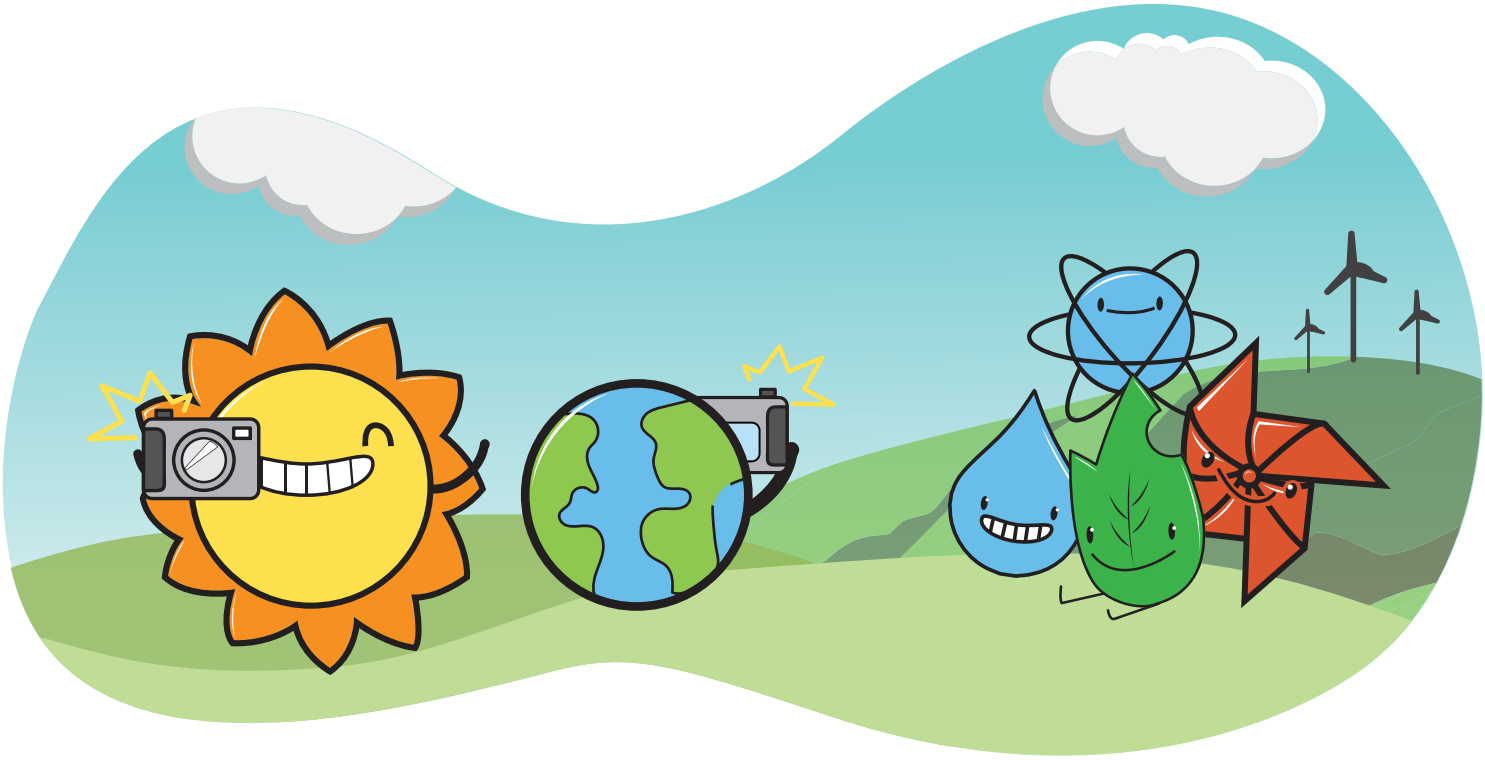
EVERSOURCE

Home Energy Challenge - Photo Scavenger Hunt Edition

Students and families work together to explore energy at home, in their communities, and even on vacation, snapping pictures of energy items around them and creating a digital or paper collage file.



NEED National Energy Education Development Project

EVERSOURCE

Proud sponsor of

energize CONNECTICUT mass save NHSaves

EVERSOURCE

Home Energy Challenge - Photo Scavenger Hunt Edition

What's In The Kit

- UV Beads
- Bookmark

What Else Will We Need?

- Camera or personal device with a camera (phone, tablet, etc.)
- Paper, tape, art supplies (optional)
- Plastic bag (optional)
- Sunscreen (optional)

✪ Challenge Overview

Energy is all around you. Energy is in living things and makes them move and grow. Energy is in lights, sounds, and in motion. Energy sources power our lives, charge our phones, and make our vehicles move. This summer's challenge encourages you to find examples of energy around you in a photo scavenger hunt. How many examples of energy can you find around you?

✔ Procedure

1. Read about energy in *Energy Overview* on page 4.
2. Review the *Scavenger Hunt Inspiration* list on page 3. Read all the possible examples for each category. What items can you add or think of that might not be included?
3. Review the *Photo Safety Rules* on page 3. Ask permission from adults and have a plan for where and what is safe and allowable to photograph. For this challenge, and for safety and privacy purposes, photos should not have faces or people in them, if possible.
4. Explore around you. Start in your home, in your backyard, and in your neighborhood. Take pictures of examples of energy around you. Can you find something from each category? How many examples of energy can you find? Are you traveling with family, heading to camp, or busy with sports? Take pictures of things you see on the way and in a different area! REMEMBER TO REVIEW THE RULES FOR PHOTO SAFETY!
5. Create a photo collage to share with the *Submission Form* on page 8. List a description of the photos on your submission form.

   Digital Collage:

   - ☐ Select 4 of your favorite photos.
   - ☐ Arrange them in a Word document, Google document, PowerPoint slide, Google slide, or Pages document.
   - ☐ Save or download the file as a PDF Document.
   - ☐ Make sure to save the file with your last name in the title.
   - ☐ Attach it to the email with your submission form.
   - ☐ Share as many photos as you wish on social media if you like. See the submission form for details and hashtags.

   Paper Collage:

   - ☐ Select 4 of your favorite photos. Print them if you like, but you don't have to.
   - ☐ If you printed your photos, arrange them on a 8.5" x 11" sheet of paper. You could also arrange them digitally first and print the file after. (See above)
   - ☐ Mail your collage with your submission form.
   - ☐ Share as many photos as you wish on social media if you like. See the submission form for details and hashtags.
6. Test out your UV beads. Check out the activity on page 7.

Home Energy Challenge - Photo Safety Rules & Scavenger Hunt Inspiration

⚠ Photo Safety Rules

Take photos only with parent supervision.

Do not trespass. Obey all signs, rules, and regulations.

Practice safe photography – look, listen, and make sure it is safe. Do not create a hazard or put yourself in unsafe conditions for a photo.

Avoid having faces in photos (including your own). To protect others privacy, pictures may not be posted on social media with faces that are visible. Cover faces with emojis or blur if you must!

Scavenger Hunt Inspiration

Look for examples of energy all around you. Can you find any of the items listed below? What other items can you add to each category?

Energy Transformations At Work

- ☐ Plants growing in the sun
- ☐ A ball bouncing or being kicked
- ☐ A campfire burning
- ☐ A person swinging on a swing set
- ☐ A calculator powered by the sun
- ☐ Clothes drying outside
- ☐ Musical instruments making sound

Energy Sources

- ☐ Solar Panel
- ☐ Wind Turbine
- ☐ A Power Plant
- ☐ Coal
- ☐ Propane Tank
- ☐ Water Wheel or Dam
- ☐ Natural Gas Stove

Energy Technologies

- ☐ Smart Meters or Electric Meters
- ☐ Battery powered devices
- ☐ Smart home thermostats
- ☐ LED bulbs
- ☐ Power lines*
- ☐ Substations*
- ☐ Heat Pump, Water Heater, Air Conditioner or Furnace
- ☐ Appliances in your Home

Energy Careers

- ☐ Utility Company Line Worker
- ☐ Welder
- ☐ Electrician
- ☐ Drone Pilot
- ☐ Solar Installer
- ☐ Eversource trucks and vehicles transporting workers*

Energy on the Move

- ☐ EV charging stations
- ☐ Public transportation (bus, train, trolley, ferry, plane)
- ☐ Refueling stations
- ☐ Biofuels

***Photograph from a safe distance**

Energy Overview

What Is Energy?

We all use the word energy daily. We have energy drinks, we pay our energy bills, and politicians discuss energy security. Our bodies and objects all around us are using energy all the time. Energy allows us to do work and make change.

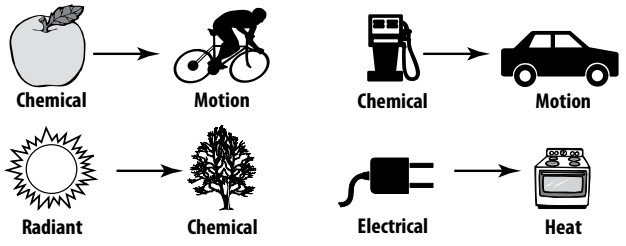
Energy exists in two basic forms. Stored energy to use later is called potential energy, while energy in motion is called kinetic energy. Kinetic and potential energy can be broken down further into nine different forms of energy.

Forms of Energy

POTENTIAL	KINETIC
Chemical Energy	Electrical Energy
Stored Mechanical Energy	Radiant Energy
Gravitational Energy	Thermal Energy
Nuclear Energy	Motion Energy
	Sound Energy

Energy is always changing forms from potential energy to kinetic energy or from one form of kinetic energy to another form.

Energy Transformations



Sources of Energy

Energy sources are the natural resources around us that we use to do work for us. They can be classified as renewable or nonrenewable energy sources. Renewable sources are called renewable because they can be replenished in a short time, or about as quickly as we use them. Nonrenewable resources take much longer to create – millions of years or more - which limits how much of them we have available to use. In the United States, we use ten sources of energy. Some states also use all ten energy sources, but others may not use all ten sources because of availability, cost, and even local laws and regulations.

U.S. Energy Consumption by Source, 2022

NONRENEWABLE, 91.5%

Petroleum 37.3%
Uses: transportation, manufacturing - Includes Propane

Natural Gas 35.3%
Uses: electricity, heating, manufacturing - Includes Propane

Coal 10.4%
Uses: electricity, manufacturing

Uranium 8.5%
Uses: electricity

*Propane consumption figures are reported as part of petroleum and natural gas totals.

Propane
Uses: heating, manufacturing

RENEWABLE, 8.5%

Biomass 5.1%
Uses: electricity, heating, transportation

Wind 1.6%
Uses: electricity

Hydropower 0.9%
Uses: electricity

Solar 0.8%
Uses: electricity, heating

Geothermal 0.1%
Uses: electricity, heating

Data: Energy Information Administration
*Total does not equal 100% due to independent rounding.

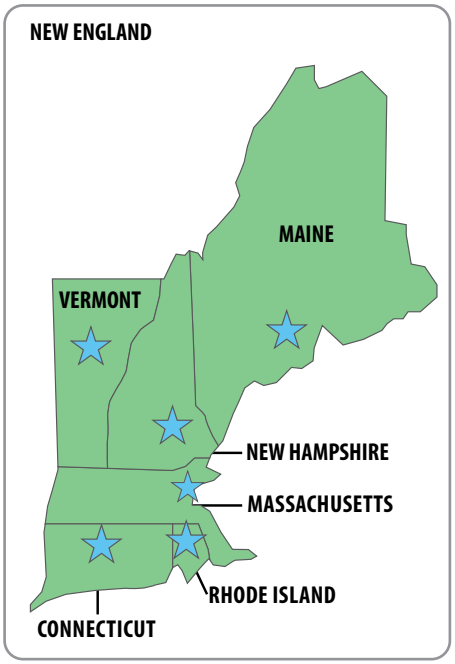
Energy Overview

How Do We Use Energy?

Energy is used in a few basic ways: to generate electricity, as a transportation fuel, to power industrial facilities and create products, and to heat and cook with in homes, businesses of all kinds, and schools. We use almost all the ten sources of energy to generate electricity. Renewables like solar, wind, and hydropower are mostly used for electricity generation. Nuclear energy is only used for electricity generation. Petroleum (oil) is mostly used for transportation and industry and sometimes as a fuel in our homes. Natural gas is used to heat and cook food with, create products in industry, for electricity, and even for transportation fuel. What sources of energy do you see being used around you?

Saving Energy

Every day, the average American uses about as much energy as is stored in six or seven gallons of gasoline! Americans use almost 4 times more energy than most people in the world! Saving energy is important because we still use lots of nonrenewable energy sources, energy use of all kinds can impact the environment in negative ways, and it costs money to use energy. Energy conservation is when you save energy through your behaviors and decisions, like choosing to turn off the lights and TV when you leave the room. Energy efficiency is also a term used to describe saving energy, but through the use of special tools, appliances, or technology that allow you to use less energy while still performing the same task. Sometimes it makes sense to install new ENERGY STAR® certified appliances because they can save you money over time, while doing the same things you need them to do in your home, but even better! What energy-saving devices do you have in your home or school?



Energy in New England

New England includes six states – Maine, Vermont, New Hampshire, Massachusetts, Connecticut, and Rhode Island. While these six states combine together to be just a bit larger than Washington State, the region is home to more than 15 million people, according to U.S. Census data from 2023, making the population density in the area significantly higher than the rest of the U.S.

New England is home to a variety of natural resources – many of which can be used for energy. As you travel around the region, you might see a lot of wind turbines, solar panels, and hydropower dams. You will also see natural gas generation facilities, and even a natural gas export facility that sends natural gas out to other states or countries. New England also uses a lot of biomass and renewable natural gas energy from trash and landfills. Some areas also use and process petroleum products for energy.

Energy Conservation & Efficiency

CONSERVATION

- Turning off the lights when you leave the room or opening the blinds for light on a sunny day.
- Setting/adjusting a programmable thermostat up a few degrees in the summer and down a few degrees in the winter.

Energy Conservation means saving energy through behavior change and decisions.

Energy Efficiency means saving energy through the use of a tool, machine, or appliance.

EFFICIENCY

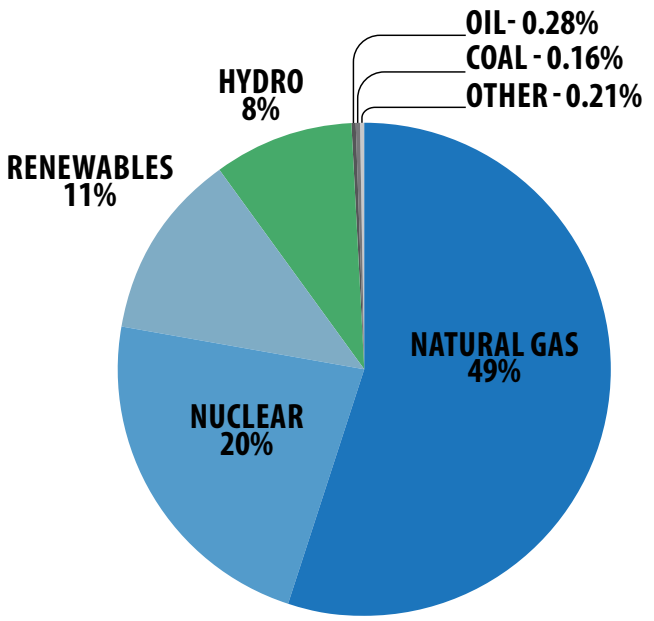
- Switching light bulbs to LEDs and more efficient fixtures.
- Upgrading heating/cooling system to a heat pump.

Energy Overview

As you likely well know, New England is home to lots of historical property, park lands, waterways, and coastal areas. With so many people in a small but beautiful area, New Englanders must be smart about how they use and transport their energy across the region.

New Englanders were some of the first U.S. citizens to prioritize renewable energy in their laws and policies. All six states have renewable and climate-friendly energy goals and portfolios for how they generate electricity. New England has one unified electric grid for moving power across the region. New England generates about half (49%) of its electricity from natural gas. Two nuclear power plants (NH and CT) combine to generate 20% of the electricity in New England. Another 20% is generated from renewable sources like wind, solar, hydropower, and biomass (trash/waste, landfill gas, wood). Very little electricity (less than 1%) is generated from oil/petroleum and coal. New England also relies on Canada and New York to import extra electricity (up to 13%) each year that it does not generate in the area.

NEW ENGLAND ELECTRICITY GENERATION



Data: EIA, ISO NE, U.S. Census

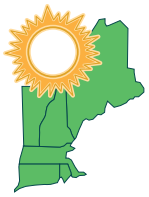
New England Fast Facts

5 of the 6 states are among the top 10 most efficient states in the U.S., using less energy per capita than 40 other states and territories. Rhode Island uses the least energy of any state.

New England states pay more for electricity than most states, with all 6 states in the top 10 states for electricity rates. Rhode Island residents pay the most at up to 31 cents per kilowatt-hour.

5 of the 6 states in New England emit less carbon dioxide than the rest of the U.S, with Maine, New Hampshire, Rhode Island and Vermont ranking 46th to 50th in CO_2 emissions.

New England is home to the United States' first offshore wind farm, with more than 15,000 MW of offshore wind energy potential in the works. Presently, New England can power more than a million homes with its turbines on land and offshore.



Solar is growing quickly in New England. Massachusetts ranks among the top 10 solar states in the U.S., for installation of solar panels, number of homes powered, and percentage of energy from solar, despite having less sunny days and more weather variability than many other states.

Data: EIA, ISO NE, U.S. Census

Online Resources

For more energy information check out these links:

The NEED Project – Energy Infobooks
need.org/need-students/energy-infobooks/

EIA Energy Kids
eia.gov/kids/

Eversource (select your state)
eversource.com

Energize CT
EnergizeCT.com

Mass Save
MassSave.com

NH Saves
NHSaves.com

ISO New England – Energy Mix
iso-ne.com/about/key-stats/resource-mix/

New England Electricity Infrastructure Map (EIA – ArcGIS)
tinyurl.com/bdh32ef3

Home Energy Challenge – UV Beads and Sunscreen

When radiant energy travels to Earth it is either absorbed or reflected by the ocean, the land, living things, and other surfaces. However, radiant energy from the sun is not just visible light that we see, it's also traveling with other types of energy or rays.

When some surfaces absorb radiant energy from the sun, they might not only heat up, they can also undergo a change from catching those rays. Plants for example, have chemical compounds called chlorophyll that allow them to create food and grow when they absorb the sun's rays. UV stands for ultraviolet light, a type of electromagnetic radiation that travels in a wave-like pattern. UV light is found within sunlight but is invisible. You are probably aware of the effects of UV radiation because you wear sunscreen and sunglasses to protect you from it. UV light causes chemical reactions that can make a substance glow or your skin to burn or tan. It also causes the formation of Vitamin D, an essential vitamin for humans and other organisms. A good amount of harmful UV radiation is blocked by the Earth's ozone layer, but the little amounts that get through will cause these chemical changes.

UV beads contain special color-changing pigments that are sensitive to UV light from the sun and other sources. These beads will quickly change back to white when they are not exposed to UV radiation. We can look outside and say "it's sunny," or "it's cloudy," but we can use the UV beads to help us get a better picture of how much of the sun's energy is reaching a certain spot in a safe way. We can use our beads to help us determine when we should be wearing sunscreen and how effective our sunscreen might be!

✔ Procedure

1. String the UV beads onto the lanyard. Tie the lanyard to make a loosely fitting bracelet to wear on your wrist.
2. Take your bracelet outside and observe the color changes in your beads.
3. Cover them or move to a very shaded spot to see how they fade and change back to their original color.
4. Take a plastic bag and spray or coat it with sunscreen. Place the beads or your bracelet inside the bag and return the bag to the sun.
5. Watch what happens to your beads. How well did you cover the bag? Are the beads changing color with sunscreen protecting them?
6. Explore different types of sunscreen and application methods. Do you have sunscreen from a few years ago? How effective is it compared to sunscreen you just purchased? Does it matter how you coat the bags? What differences do you notice with different SPFs and types of sunscreen (spray, lotion, oil, mineral, etc.)?

EVERSOURCE

Final Data Collection & Submission Form

Complete this form and submit it with your Home Energy Challenge –Photo Scavenger Hunt Collage to be entered into our prize drawing.

Student Name: _____

Student Address: _____

Student Grade: _____ School:_____

Parent Email:_____ Parent Phone Number:_____

Data

Picture description	Location/town of item in picture	How energy is involved in this picture

1. Email this form and attach your Photo Scavenger Hunt PDF OR mail this form with your paper collage in order to be entered in prize drawing for an iPad.
   Submissions are due on or before August 8, 2024:

   Email: info@homeenergychallenge.com

   Mail:
   Eversource Home Energy Challenge
   P.O. Box 313
   Rowley, MA 01969-9998
   ATTN: Scott Halstead

2. Optional (but encouraged): Post as many of your scavenger hunt photos as you like on your social media channels (Facebook, Twitter, Instagram, etc.). Use #HomeEnergyChallenge and tag Eversource in your particular state: @EversourceMA, @EversourceCT, or @EversourceNH. **Posting on social media does not increase your chances of winning.*

x _____

By signing this form I confirm that I am a legal U.S. resident residing in one (1) of the Massachusetts, New Hampshire, and Connecticut communities listed in the Official Rules, am eighteen (18) years of age or older, and am a parent or guardian of a current student in grades K-12. Visit our website for official rules www.homeenergychallenge.com.