Coal Comes to Anytown: A Public Meeting

In this activity, students will participate in a mock public meeting to determine a site for a new energy facility in their community. The occasion for the meeting is public concern over a power company's proposal to build a coal-fired generating plant near your town.

This activity will help students:

- understand that all electricity-generating facilities have both positive and negative impacts on the communities in which they are located
- experience the difficulty of finding an energy source that meets the needs and demands of different interests in a community
- gain an appreciation of the importance of citizen participation in energy decision making
- practice decision-making skills and prepare oral presentations aimed at persuasion

The announcement of a location for a new energy facility often creates a public uproar in the community where the facility is to be built. Citizens who may have been previously uninterested in energy issues or the environment suddenly become concerned with air pollution, visual pollution, noise, land use, the health and safety risks of the proposed energy source, carbon dioxide emissions, and global warming.

Often, citizens form committees to stop proposed energy facilities from being built. Some community members may express a not-in-my-backyard, or "NIMBY," attitude. They do not care what energy source is used, as long as it is built somewhere else, far away from their own neighborhood. Public opposition is most common with large fossil fuel and nuclear generating plants, but it is important to remember that there are also site-related issues associated with hydro, solar, wind, geothermal, and biomass power sources. Citizen groups working to stop these renewable energy facilities may become increasingly common as these sources of energy are developed.

It is important that citizens who are concerned about the environment realize that it is unrealistic to demand an impact-free power source. Unless people are willing to stop using electric power entirely, communities must be willing to accept electricity-generating plants in their area. At the same time, politicians and energy regulators must take responsibility for choosing the best technology or site for a new power plant, instead of assuming any will do. They must also consider seriously the possibility of conserving energy as an alternative to new energy supplies, as energy efficiency measures may make construction of a new plant unnecessary.

GRADES: 9–12

SUBJECTS: social studies, environmental studies, geography, science

TIME: three to four 45-minute class periods (one for the introduction and two to three for the hearing, plus one to two weeks for independent research)

STUDENTS NEEDED: 15 or more

MATERIALS:
- large map of your county
- one role card for each student—you can write these on index cards
- Renewables for the Nation handout for each student (pg. 64)
- Energy Source Information handout for each student (pg. 65)

PREPARATION:

1. Prepare one role card for each student (see the teacher information sheet on pg. 63).
2. Photocopy Renewables for the Nation and Energy Source Information handouts.
3. Using the map, site a new coal plant in your county. It should be located as close as possible to your town, keeping in mind that it must be next to a source of water for cooling and near a port or rail line to receive the coal.

PROBLEM STATEMENT:

The president of the United States has announced a new energy independence program. Her/his goal is to have each county in the nation produce 20 percent of the electric power it uses within its own borders. In order to meet this goal, a power company is proposing to build a new 100-megawatt coal-fired power plant in your county.

This plan has evoked strong feelings in the county. Citizens have quickly taken sides on the issue. In order to make a decision that best reflects the interests of the community, county officials have scheduled a public meeting on the plan. They have invited representatives of different energy sources, including coal, to testify before the county council.

The county council has three options: it can recommend that the power company's plan be approved; it can propose a different site for the coal plant; or it can suggest sites for alternative sources of energy. After hearing testimony from a variety of energy advocates, the council will discuss and deliberate the merits of each energy proposal and attempt to come to a consensus.

Note: If you are located in a densely populated urban area, it might be impossible to site a power facility in your county. In this event, you can expand the area to a 50-mile radius, keeping in mind that the objective of the activity is for students to come to terms with the environmental impact of a project in their area. Conversely, if your county is very large, you may want to limit the area to your town, so that students will not be tempted to site energy facilities at a great distance from where they live.

PROCEDURE:

1. Read or distribute the problem statement to the students. Show them where the power company plans to site the coal plant on the county map.

2. Explain to students that they will be role-playing members of the county council or energy advocates in a mock public meeting. Distribute one role card and the student handouts to each student.

3. Explain to students that energy advocates are responsible for promoting their source of energy. Possible advantages of their energy source for the county can include low environmental impact, low immediate cost to consumers, low long-term cost to the public, and jobs created in construction, operation, and maintenance of the energy facility.

County council representatives are responsible for representing their constituencies. They should consider the advantages of each technology, as well as the possible negative impact of any proposed facility on the people they represent, including loss of land, pollution of air and water, possible health risks, and a possible rise in electric rates.

4. Let students who are advocating the same sources of energy or representing the same interests meet to come up with a research plan.

5. Schedule a date for the county hearing. Give students at least a week to prepare. Students who are representing the same energy source or constituency should work together.

   Energy advocates should research their sources of energy and come up with a specific plan for an electricity-generating facility. Each advocate or team of advocates should prepare a five-minute presentation for the council.

   County council members should research the attitudes of their constituencies. One way to do this is to have them actually speak to a sample of people in the community about their attitudes toward different energy sources. They should also draw up a list of questions to ask the energy advocates.

6. On the day before the hearing, distribute a schedule. Each advocate or team will be allowed five minutes to make a presentation. After each presentation, there will be a five-minute question period for committee members.

7. Hold hearings. This may take two to three class periods, depending on the size of your class.

   You, the teacher, will preside over the hearings as county energy commissioner. At the end of the presentations, the committee will retire for one class period to discuss the options. Energy advocates can use this time to prepare a written siting proposal.

8. Have the committee choose a spokesperson to announce its decision. Each member can explain his or her reasons for coming to this conclusion. Discuss the implications of the committee's recommendation for the county. Which groups are likely to support the plan? Which might oppose it?

9. It is possible that the committee will be unable to reach a consensus. In this case, discuss what might happen then in a real community. Possible outcomes could include:

   - The project is delayed, leading to increased cost and possible power shortages.
   - The power company's plan is adopted by default.
   - One faction in the council mobilizes a powerful constituency and lobbies higher authorities to accept its plan.
   - The county energy commissioner overrides the committee's authority.
   - State authorities intervene to speed up the process.
   - The federal government sues the state or county for failing to comply with the law.
   - The issue is placed on the ballot.

   Discuss how each interest group and the community at large might be affected by these outcomes.

VARIATIONS:

1. Let energy advocates lobby committee members in advance of the hearing. They could also post advertisements for their energy sources in the classroom.

2. Invite other classes or parents to attend the hearing. These outsiders would represent the general public in the county. Assign two students to be reporters for a local newspaper. Have the reporters interview energy advocates and committee members and write a series of articles on the power company's plan and some alternatives. Distribute these articles to other classes or parents in advance of the hearing to give them some background. At the end of the hearing, ask the audience to vote on the plan and alternatives. The committee can then use the results of the vote in making their decision.

EXTENSIONS:

1. Discuss how energy decisions are made in your area. Are there any avenues for citizen participation? Your state public utility commission or department of energy should have such information.

2. Find out how your local electric utility plans to meet demand over the next 25 years. Do they expect to purchase electricity from new generating facilities? Have students write to members of the utility's board of directors with their recommendations for the future.

Note: Maps depicting state renewable energy potential are periodically updated. To obtain up-to-date maps, please visit the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy at www.eere.energy.gov.

Coal Comes to Anytown: Preparing Roles for the Public Meeting

The following are possible student roles for the public meeting:

County council members

- Two businesspeople: factory owner, computer distributor, department store manager, etc.
- Two environmentalists: environmental club member, park ranger, etc.
- Two consumer group members
- Two labor people: construction worker, coal miner, technician, farmer, etc.
- One tourism person: hotel manager, restaurant owner, etc.
- One health person: doctor, nurse, health insurance agent, etc.

Energy advocates

- Two coal
- Two nuclear
- Two oil
- Two natural gas
- Two waste-to-energy
- Two biomass
- Two wind
- Two solar thermal
- Two solar electric
- Two geothermal (if applicable in your area)
- Two hydro (if applicable in your area)

For variation #2:

- Two reporters

You should make council member roles as specific to your community as possible. For instance, if you live in an area with large coal deposits or timber resources, you may want one of the students representing labor interests to be a coal miner or logger. If you live in a community with a national or state park, one of your environmentalists could be a park ranger.

To prepare the energy advocate cards, refer to the Renewables for the Nation and Energy Source Information handouts to determine which energy sources would be feasible in your region. If hydro, solar, geothermal, or wind resources are not present in your area, do not use these cards.

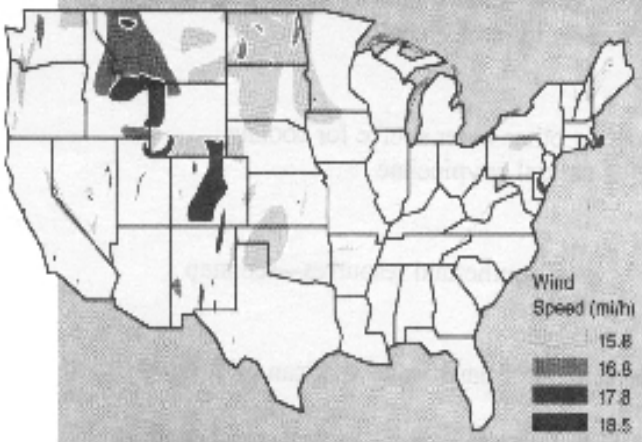
Prepare as many role cards as there are students.

Renewables for the Nation

The potential of renewable energy has often been seen as tightly restricted to the few sites that offer the very best resources. Today individual renewable options still tend to be regionally defined, but technology advances will expand practical applications into medium-grade resource areas—and to far more of the country than was thought possible a decade ago.

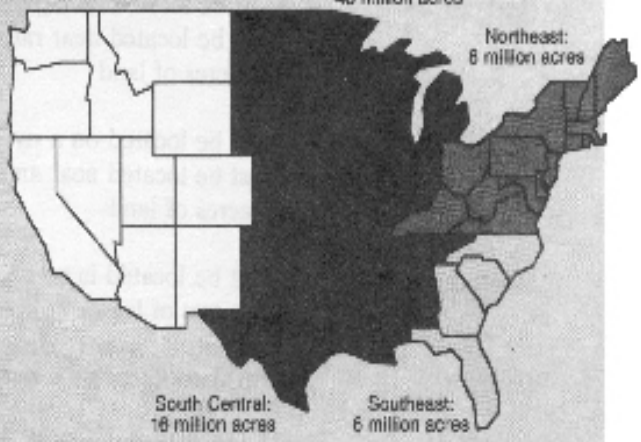
Wind

The midwestern states extending from North Dakota and Montana down to New Mexico have much greater wind generation potential than the few California sites developed to date. The ability to back up a good intermittent wind resource with plentiful hydro makes the Northwest look promising as well.



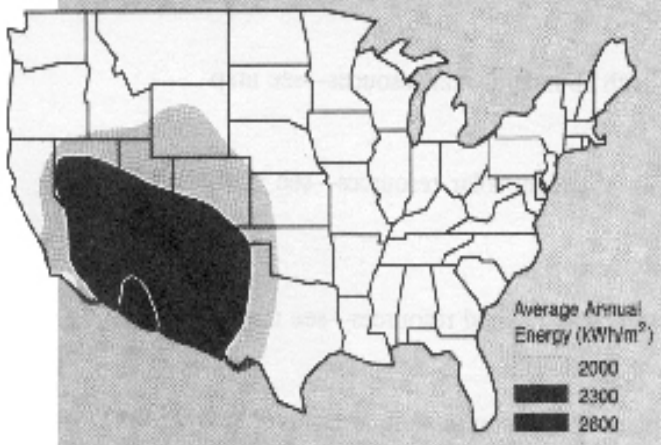
Biomass

The Midwest is ideal for growing short-rotation woody crops and other combustible vegetation, which could be planted on land that is idle or has only marginal value for growing food. The total U.S. energy crop potential is some 70 million acres—almost 18% of the nation's arable land.



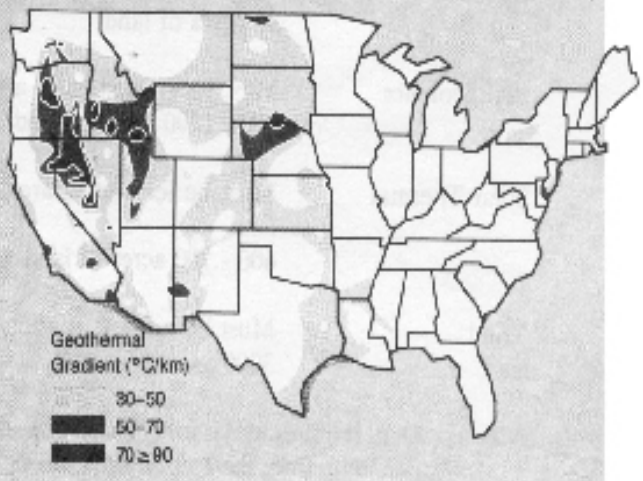
Solar

The desert regions of the United States hold the obvious first opportunities for significant penetration of solar technologies, although photovoltaics can be economic for remote low-power applications in virtually all parts of the country.



Geothermal

While most of the land west of the Missouri River is underlain by hydrothermal or hot dry rock resources, geothermal development for the foreseeable future will concentrate on pockets with thermal gradients of at least 70°C/km.



Credit: Electric Power Research Institute

Energy Source Information Sheet

STUDENT HANDOUT

Energy Source	Site Requirements
Biomass	Must be located on a river, lake, or other water source for cooling Must be located near a source of biomass (plants, trees, organic municipal waste)—see map 100–200 acres of land (although the amount of land needed to supply fuel for the plant would be much greater)
Coal	Must be located on a river, lake, or other water source for steam and cooling Must be located near rail line or port to receive coal 300 acres of land (although the amount of land required to extract, process, and deliver the fuel would be much greater)
Natural Gas	Must be located on a river, lake, or other water source for cooling Must be located near an existing natural gas pipeline 30 acres of land (although the amount of land required to extract, process, and deliver the fuel would be much greater)
Geothermal	Must be located in an area with good geothermal resources—see map 50–300 acres of land
Hydro	Must be located on a river, downstream from a valley that can be flooded
Nuclear	Must be located on a river, lake, or other water source for steam and cooling Must be located on a site where there is little danger of earthquakes Must be located in an area that would be possible to evacuate 1,000 acres of land (This is for a 1,000-megawatt plant. Small nuclear power plants are not generally available.)
Oil	Must be located on a river, lake, or other water source for cooling 30 acres of land (although the amount of land required to extract, process, and deliver the fuel would be much greater)
Photovoltaics	Must be located in an area with abundant solar resources—see map 900–1,200 acres of land (although PV arrays could be placed on the rooftops of existing structures)
Solar Thermal	Must be located in area with abundant solar resources—see map 300–500 acres of land
Wind	Must be located in area with abundant wind resources—see map 1,100–4,000 acres of land depending on the size of the turbines (The actual footprint of the turbines and access roads is much smaller, allowing for farming, grazing, or other land uses in the remaining area.)

Note: Land requirements are for a 100-megawatt plant and are extrapolations from 1997 data from the Electric Power Research Institute, the Department of Energy (DOE, 1983), and the American Wind Energy Association (2002), which referred to many generating facilities of different sizes. Therefore, the numbers listed on this sheet may not be accurate.