NATIONAL GEOGRAPHIC

RESOURCE LIBRARY
ACTIVITY : 2 HRS

Stakeholder Debate: Wind Energy

Students investigate conflicts over the use of wind energy in Nantucket Sound, take on the role of a stakeholder in the debate, and hold a town council meeting to decide whether or not a wind energy project should be implemented.

GRADES

9 - 12+

SUBJECTS

English Language Arts, Geography, Human Geography, Physical Geography

CONTENTS

16 Images, 7 PDFs, 6 Links

OVERVIEW

Students investigate conflicts over the use of wind energy in Nantucket Sound, take on the role of a stakeholder in the debate, and hold a town council meeting to decide whether or not a wind energy project should be implemented.

For the complete activity with media resources, visit:
http://www.nationalgeographic.org/activity/stakeholder-debate-wind-energy/

Program

CONNECT! TRANSFORM THE FUTURE

DIRECTIONS

1. Activate students' prior knowledge by discussing the complexities of decisions about energy and of wind energy in particular.

Ask students to list some different resources they know of that can be used to generate electricity. Ask them to consider how people decide which energy resources to use. Ask: *Who makes these choices? What factors do you think should be considered? Do towns choose just one energy resource to power their homes and businesses? Why or why not?* Ask students to describe in general how wind energy is harnessed to provide electricity. Discuss some of the benefits and drawbacks of using wind energy for electricity.

2. Introduce the case study to students and have them read it.

Distribute a copy of the handout Case Study: Cape Wind Project and the Cornell Notetaking worksheet to each student. Explain that Cape Wind is a proposed offshore wind farm to be located in Nantucket Sound. Ask students to locate Nantucket Sound on a classroom wall map of the United States. Ask students what they know about this area. They may have heard of Martha's Vineyard, which borders Nantucket Sound, or Cape Cod, which is just north of it. Discuss the geographic characteristics of this area that make it well-suited for capturing wind energy. Have students independently read the case study and use the Cornell Notetaking worksheet to record important information about the effects of the project on various stakeholders. When students have finished reading, discuss the case study as a class. Ask:

- *What are some reasons the project has been in development for over ten years?*
- *Which stakeholders support the project? Which stakeholders do not support it?*
- *What are their reasons? Do you think these are valid reasons? Why or why not?*
- *What are some of the social, environmental, political, and economic factors that affect these stakeholders?*
- *In your opinion, which stakeholders should have the most say in the decision-making process? Why?*

3. Introduce the town hall meeting project.

Explain that students will take on the roles of the stakeholders in this project. They will research the project further, develop an argument, and present their argument at a town hall meeting. Divide students into small groups, and assign each group a stakeholder role from the Cape Wind case study. Distribute a copy of the Stakeholder Chart worksheet and the Decision Matrix worksheet to each small group. Review the directions with students and answer any questions they might have.

4. Have groups conduct research and analyze their stakeholder's position.

Have each group set research goals and divide research tasks among the group members. Have students use the provided websites to further research the Cape Wind project. Have them use the Stakeholder Chart to take notes as they research. Remind students to cite each source they reference. Students should report their research findings back to their small group. When students have gathered enough research, have them discuss what they have found in their small groups. Have them work as a group to list the benefits and drawbacks of the project from their stakeholder's perspective on the Decision Matrix graphic organizer.

5. Model creating a position statement.

Explain that next students will write a position statement expressing their stakeholder's position in the Cape Wind project debate. Stress that students must first craft a one- to two-sentence position statement that clearly and succinctly expresses their position. They should then expand the statement, using facts from their research to support their position. Use the Sample Position Statement to model the thought process involved in determining possible positions on a topic, generating supporting reasons for those positions, and then crafting a solid position statement. Emphasize that position statements must be arguable. This means that an argument could be made for or against the statement. A statement of known fact is not a position statement. Model a few good and poor examples of position statements for students. Briefly model how to expand a supporting reason into a paragraph with factual evidence.

6. Have students write a position statement.

Distribute the Position Statement Rubric and review it with students. Have students work in their small groups to craft a position statement.

7. Conduct the town hall meeting.

Distribute the Debate Rubric and review it with students. Take on the role of moderator, and call the town hall meeting to order. Remind students that they should remain in the role of their group's stakeholder throughout the meeting. Invite each group to have one member present the group's position statement. Following each statement, allow the audience to ask questions. When all groups have presented their statements, allow students a few minutes to discuss the issue. Finally, call for a vote on the question: Should the Cape Wind project be built in Nantucket Sound?

8. Discuss the meeting and the vote.

Follow the town hall vote with a classroom vote. Have students vote on the issue from their own perspective, rather than from the perspective of their assigned stakeholder. Ask them to notice how the votes changed, if at all. Ask:

- *Which environmental, political, social, and economic factors are most important to you in determining your vote on this issue? Why?*
- *How did your personal decision-making compare to that of the stakeholder you represented?*
- *What were some challenges you experienced in analyzing the problem from a different perspective?*
- *Are there other possible solutions besides a simple yes or no? What kinds of compromises might be reached?*
- *Would you consider changing your vote under certain circumstances? What are those circumstances?*

TipTeacher Tip

In step 6, check in with all groups early in the writing process to be sure they are on the right track with their position statements.

TipTeacher Tip

In step 7, set the stage for the town hall meeting by staying “in character” as the moderator. This will help students stay in character as the stakeholder they represent.

Informal Assessment

Use the provided Position Statement Rubric and Presentation Rubric to assess students’ position statements and performance in the debate.

You can also observe students presentations and provide feedback. Reference the Position Statement and Presentation Rubrics for specific criteria to consider.

Extending the Learning

Have students research other areas where wind farms were successfully built. Have them select one area and compare and contrast the geography of that area with the geography of Nantucket Sound. Then have them compare and contrast any conflicts with the wind farm in that area to the conflict surrounding the Cape Wind project.

Ask students to consider the following question: *Why is it important to use a variety of energy resources?* Ask students to propose an alternative solution for the Cape Wind conflict based on using a variety of energy resources.

OBJECTIVES

Subjects & Disciplines

- English Language Arts

  Geography
  - Human Geography
  - Physical Geography

Learning Objectives

Students will:

- research and identify stakeholders vested in the debate over using wind energy as an energy resource
- develop a stakeholder position statement for the debate over using wind energy as an energy resource
- present and debate the position of a stakeholder in the debate over using wind energy as an energy resource
- decide on a course of action based on the debate

Teaching Approach

- Learning-for-use

Teaching Methods

- Brainstorming
- Discussions
- Research
- Role playing
- Writing

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
  - Information, Media, and Technology Skills
    - Information Literacy
    - Media Literacy
  - Learning and Innovation Skills
    - Communication and Collaboration
    - Critical Thinking and Problem Solving
- Critical Thinking Skills
  - Analyzing
  - Evaluating

- Geographic Skills
  - Analyzing Geographic Information
- Science and Engineering Practices
  - Engaging in argument from evidence
  - Obtaining, evaluating, and communicating information

National Standards, Principles, and Practices

ENERGY LITERACY ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

• **Fundamental Concept 4.7:**
Different sources of energy and the different ways energy can be transformed, transported, and stored each have different benefits and drawbacks.

IRA/NCTE STANDARDS FOR THE ENGLISH LANGUAGE ARTS

• **Standard 7:**
Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.
• **Standard 8:**
Students use a variety of technological and informational resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

NATIONAL COUNCIL FOR SOCIAL STUDIES CURRICULUM STANDARDS

• **Theme 7:**
Production, Distribution, and Consumption

NATIONAL GEOGRAPHY STANDARDS

• **Standard 14:**
How human actions modify the physical environment

NATIONAL SCIENCE EDUCATION STANDARDS

• **(9-12) Standard F-3:**
Natural resources
• **(9-12) Standard F-4:**
Environmental quality
• **(9-12) Standard F-6:**
Science and technology in local, national, and global challenges

COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

• **Speaking and Listening Standards 6-12:**
Presentation of Knowledge and Ideas, SL.9-10.4
• **Speaking and Listening Standards 6-12:**
Presentation of Knowledge and Ideas, SL.11-12.4
• **Writing Standards 6-12:**
Text Types and Purposes, W.9-10.1
• **Writing Standards 6-12:**
Text Types and Purposes, W.11-12.1

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Pencils
- Wall map of the United States

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per learner, Projector

PHYSICAL SPACE

- Classroom

SETUP

For the town hall meeting, arrange chairs facing a podium or desk in one area of the room.

GROUPING

- Large-group instruction

OTHER NOTES

This activity should be conducted over two class periods. Complete steps 1 through 6 in the first session, and then hold the debate during a second session.

BACKGROUND & VOCABULARY

Background Information

Wind is a renewable energy resource for generating electricity. Wind turbines are designed to be easily turned by the wind. As the wind turns the rotor, it spins a generator to convert the mechanical energy to electrical energy. Because wind is highly variable, wind turbines must be carefully placed in areas such as mountaintops where high winds are common. Off-shore wind turbines are designed to take advantage of the strong winds found at sea. These winds have the added advantage of being less turbulent than winds normally found on land. Turbulent winds can decrease the efficiency of wind turbines and increase the wear and tear on the system, shortening its lifespan and increasing cost.

Wind energy has a number of benefits. It is a relatively clean source of energy, producing no pollution after the building phase. Wind energy is also renewable and plentiful. There are drawbacks to wind energy as well. People who live near wind turbines often object to the noise they create, as well as their impact on the landscape. Wind turbines can also pose problems for birds and bats, which are often killed if they fly into the rotors. Wind energy is also site-specific; conditions have to be right for turbines to create enough energy to be worthwhile. Although wind energy is abundant on Earth, it is unreliable; wind does not blow at the same strength at all times. This fluctuation makes it difficult to rely on wind energy as the sole source of electricity; however, wind energy can be an important part of a diversified energy portfolio. Combining energy resources such as wind, solar, and even biogas from

animal plant waste can provide a secure source of electricity while reducing human dependence on fossil fuels. Such diversification can take advantage of location-specific energy resources such as wind, geothermal, and hydropower resources.

When considering the use of any energy resource, social, environmental, political, and economic factors must be considered. Social factors might include ways the people in the community view the energy resource, the ethics of the community, and social considerations such as economics and politics. Environmental factors might include the consideration of pollution caused by the energy resource, as well as land use, effects on habitats and animal species, and other issues. Political factors include priorities of the current government as well as the structure and power balances within the government. Economic factors include the initial cost of infrastructure for an energy resource, the ongoing costs of using that resource, and supply and demand.

Prior Knowledge

["Energy Literacy Principle 1: Energy is a physical quantity that follows precise natural laws.","Energy Literacy Principle 2: Physical processes on Earth are the result of energy flow through the Earth system.","Energy Literacy Principle 3: Biological processes depend on energy flow through the Earth system."]

Recommended Prior Activities

- None

Vocabulary

Term	Part of Speech	Definition
argument	*noun*	reason or set of reasons given with the aim of persuading others that an action or idea is right or wrong.

Term	Part of Speech	Definition
case study	*noun*	form of problem-based learning, where the teacher presents a situation that needs a resolution. The learner is given details about the situation, often in a historical context. The stakeholders are introduced. Objectives and challenges are outlined. This is followed by specific examples and data, which the learner then uses to analyze the situation, determine what happened, and make recommendations.
debate	*noun*	instructional strategy that fosters the mastery of content and the development of critical thinking skills, empathy, and oral communication skills. The process of considering multiple viewpoints and arriving at a judgment. Applications range from an individual using debate to make a decision in his or her own mind to an individual or group using debate to convince others to agree with them.
electricity	*noun*	set of physical phenomena associated with the presence and flow of electric charge.
energy resource	*noun*	source of energy found in nature that has not been subject to any human-induced energy transfers or transformations; for example, oil, coal, gas, wind, or sunlight.
energy source	*noun*	location in which the energy resource (oil, coal, gas, wind, etc.) is converted into electrical energy.
evidence	*noun*	data that can be measured, observed, examined, and analyzed to support a conclusion.
moderator	*noun*	individual that facilitates a debate or discussion, ensuring balanced participation and controlling the pace of the discussion.
non-renewable energy	*noun*	energy resources that are exhaustible relative to the human life span, such as gas, coal, or petroleum.
offshore	*adjective*	having to do with facilities or resources located underwater, usually miles from the coast.
position statement	*noun*	a thesis describing one side of an arguable viewpoint and supported by facts.
power plant	*noun*	industrial facility for the generation of electric energy.
renewable energy	*noun*	energy obtained from sources that are virtually inexhaustible and replenish naturally over small time scales relative to the human life span.

Term	Part of Speech	Definition
stakeholder	*noun*	person or organization that has an interest or investment in a place, situation, or company.
wind energy	*noun*	kinetic energy produced by the movement of air, able to be converted to mechanical power.
wind farm	*noun*	area with a large group of wind turbines, used to generate electric power.

For Further Exploration

Articles & Profiles

- National Geographic Environment: Wind Power

Maps

- National Geographic Maps: Energy Realities

Websites

- Energy.gov: Wind Energy
- Wind Energy Development

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