

Country Power Simulation

Grades Level: 8-10

Objectives: Students will be able to:

- Use critical thinking to answer the problem.
- Use the knowledge of the ecology around them to find the best answer.
- Recall the renewable and nonrenewable resources.
- List what resources are needed for their country's power.

Concept: To develop critical thinking skills as well as ecological knowledge by simulating what students would do if they have the rights to a country of their own; mostly related to the rights of the power grid system. Students will find and plan ways to produce energy, while learning about the use of global renewable and nonrenewable resources.

Source: Energy Needs in Developing Countries and Sustainability, by Jose Goldemberg.

Time allotted: 1 hour

TEKS: World History:

(19) Science, technology, and society. The student understands the impact of technology and human modifications on the physical environment. The student is expected to:

(A) evaluate the significance of major technological innovations, including fire, steam power, diesel machinery, and electricity that have been used to modify the physical environment; and

(B) analyze ways technological innovations have allowed humans to adapt to places shaped by physical processes such as floods, earthquakes, and hurricanes.

(20) Science, technology, and society. The student understands how technology affects definitions of, access to, and use of resources. The student is expected to:

(A) describe the impact of new technologies, new markets, and revised perceptions of resources;

(23) Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others, in a variety of settings. The student is expected to:

(A) plan, organize, and complete a group research project that involves asking geographic questions; acquiring, organizing, and analyzing geographic information; answering geographic questions; and communicating results;

(B) use case studies and geographic information systems to identify contemporary geographic problems and issues and to apply geographic knowledge and skills to answer real-world questions;

(C) use a problem-solving process to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution; and

(D) use a decision-making process to identify a situation that requires a decision, gather information, identify options, predict consequences, and take action to implement a decision.

Background Information:

In the 21st Century, there is a debate of how countries should produce energy. Knowing that there are just a few nonrenewable resources left, people believe that renewable resources are the answer. Energy is an essential ingredient of growth and development for a country. In developing countries, energy is crucial to life for its industry and its economy. Currently, developing countries are looking toward renewable resources due to the scarcity of other nonrenewable resources.

For developing countries, nonrenewable resource production is affordable, and the countries feel that wind and solar energy will last longer and, therefore, be cheaper for them to maintain. By using this simulation, students will see how the decision making process works, and how they might solve the energy production crisis. Some countries, such as the United States and Eastern European countries, already have vast power sources which are cheaper to keep than to implement newer renewable energy production methods. There are four countries being simulated in this lesson: two are developed and two are developing. This simulation will help bring awareness toward the decision of what the world should do to produce power.

Materials needed:

- Sheets of information for individual countries
- Quiz

Engagement: (5 minutes)

Tell students that today they will participate in a simulation in which they are the leaders of a made up country. They will need to find the best way to produce energy for their country. Split the students in four groups.

Exploration: (40 minutes)

Now give each group one sheet of information about their countries.

Let the students plan what they believe they should do. Remind them to fill out their sheets and to make it as realistic as possible.

After about 25-30 minutes, let the groups present to the whole class what they would do as their country's leaders. Make sure they state what helped them in their decision making as well as why they avoided certain technologies.

Explanation: (10 minutes)

As a class, discuss the decisions the different groups have made. What is the best possible way for countries today to produce energy? What do the students believe is best?

Evaluation: (5-10 minutes)

Let the class then take the quiz provided. Also, evaluate individual participation in the group presentation, as well as how organized and rational their presentation was.

Names: _____

Name of Country: _____

Description of Country:

You live in a country which is very well developed. Many people live in this country, but there is not an overpopulation problem yet. Your country has parts where wind can be stored as well as hydroelectric (water) and solar power. However, your country mostly uses oil and coal to produce power since these nonrenewable energy sources are already in place and affordable. Now, these resources are becoming scarcer in your country and you may need to import the resources from other countries who have oil and coal. Nonrenewable resources are coming to mind, but there is a very big cost to make and build these structures.

What do you do?

What helped you in this decision making process?

What do you believe would be the worst thing you should do?

Does your decision seem reasonable and cost efficient?

Names: _____

Name of Country: _____

Description of Country:

You live in a country of five islands. These islands are mostly full of foliage such as that of a rainforest/jungle. Your country is still a developing country. Not much infrastructure is set up or organized. You have much work to do. The islands are pretty much populated with people. Not much sun comes through the canopy from the trees. On the shores of the islands, wind is very powerful. Big places to produce power can take too much room away from the island. Also, your country is so isolated that you know little about some technologies. Also, nonrenewable resources are cheap, but are becoming scarcer. Renewable resources are also known to not always be a reliable source of energy production.

What do you do?

What helped you in this decision making process?

What do you believe would be the worst thing you should do?

Does your decision seem reasonable and cost efficient?

Names: _____

Name of Country: _____

Description of Country:

You live in a country that is part of a mainland. You are able to communicate to other countries, but you are still a developing country. You have the skill and land to do some things, but little money. Energy is needed for your country to flourish. You may use nonrenewable resources since they are relatively cheap and provide people with work. But you know that they are becoming scarcer. Wind and solar power can be easily captured to produce energy, but they have a high start up cost. You do not have any rivers strong enough for hydroelectric needs since finding water is sometimes hard. You also know that renewable resources cannot always be present to produce power for your country.

What do you do?

What helped you in this decision making process?

What do you believe would be the worst thing you should do?

Does your decision seem reasonable and cost efficient?

Names: _____

Name of Country: _____

Description of Country:

You live on a very big island. You are a very well developed country. You are populated and it seems that you are becoming more crowded every decade. You already have nonrenewable energy production being used, but you are not able to find your own resources and therefore rely upon other countries to give them to you. You know that these resources will eventually become extinct. Your shores are able to capture wind. But you really do not want to spend the money to use renewable resources since you already have other means of making energy.¹

What do you do?

What helped you in this decision making process?

What do you believe would be the worst thing you should do?

Does your decision seem reasonable and cost efficient?

Learning Module developed by Stephen
Environmental Science Institute (<http://www.esi.utexas.edu>)

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Name: _____

Energy Simulation Quiz

What are some renewable resources? (at least 3)

What are some nonrenewable resources? (at least 3)

Why are people today thinking why countries should rethink their system of producing energy?

Why do developing countries believe making renewable systems to produce energy is better for their country?