CONSERVATION STATION

WEEK OF RESOURCEFULNESS CLASSROOM ACTIVITY

TOPIC

Create a Global Energy Infographic

KEY LEARNING OBJECTIVES

Students will be able to:

- **Compare** energy use by various countries around the world
- **Discover** the insights that statistics and data can give us about a global issue
- **Interpret** and **illustrate** data in a way that is visual and utilizes technology

OVERVIEW:

In this activity, students will use the Global Energy Statistical Yearbook 2018 to view data about energy use around the world. They will be able to look at various types of energy use, such as oil, gas, and renewable energy, by country and compare and contrast how different countries consume energy. They can view trends over time and discover how energy consumption has changed or stayed consistent over the past 30 years and infer reasons for these trends. Students can work alone or in pairs and will use a digital template to create an infographic that will inform the reader about global energy usage by one country. They should pick out the information, facts, and statistics from the website that they think is most important or surprising about what types of energy their country is consuming, producing, and trading. They should share the factors may account for these statistics and ways the country may be able to increase energy efficiency in the future.

CONNECTION TO THE ENERGY-WATER NEXUS

- It is important to collect and analyze data on how countries produce and consume the world's energy sources
- Looking at energy use on a global scale can help us determine where conservation is most important and monitor the use of both non-renewable and renewable energy resources

NATIONAL STANDARDS

Science

Next Generation Science Standards

MS-ESS3-4 Earth and Human Activity

Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Itron | Discovery EDUCATION

MS-LS2-1 Ecosystems: Interactions, Energy, and Dynamics
Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-ESS3-2 Earth and Human Activity
Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects

BACKGROUND INFO

Have you ever wondered who leads the world in energy use? That question may not be as easy to answer as you would think! In 2017 China was reported to be the largest global consumer of energy, with the United States taking second place. Yet in 1990, China was third on the list of total energy consumption. What factors do you think may be responsible for China's surge in energy consumption in the last 25–30 years? Is it economic growth? Is it a massive population? How do the economy and population of China compare to that of the United States? Are we comparing apples to oranges?

Using data to help determine global energy usage and trends is very important to monitor and conserve our energy resources for the future. It allows countries and global alliances to make laws that protect our natural resources and can encourage both developing and developed countries to design new ways of using energy. In this activity, students will create an energy profile of a country, using data to determine how and why they use energy in the ways and forms that they do.

KEY VOCABULARY

- Infographic
- Per capita
- Total energy production
- Total energy consumption

MATERIALS

- Student devices with internet access

TEACHER PREPARATION

- Teacher should choose countries from the list of top energy consumers on the website Global Energy Statistical Yearbook 2018 to assign to groups for their infographic. Some countries will be more appropriate than others and will have more data for students to use.

PROCEDURE

1. Open the lesson by asking students what to think about what are the biggest problems that the world is facing right now. Allow students to share some of their ideas with the class and create a short list on the front board or overhead screen. Direct students to the Resourcefulness: An Introduction to the Water-Energy Nexus app http://stem.guide/ on their devices. Have them click the "Start Here" section

and read through "The World's Biggest Challenges." After a few minutes of reading time, refer back to the original list of problems that students created, and ask them to think about and briefly share how energy—the world's biggest challenge—could be linked to each one.

2. Next, show students the following video clip: https://www.youtube.com/watch?v=MFXtK6zSbEA. Explain to students that the clip has given them various statistics about energy production and consumption around the globe. Ask students to share why they think energy usage is so different in various parts of the world? What contributes to these differences? Allow students to share their answers with the class.
3. Direct students to go to the following website on their devices (laptop, iPad): https://yearbook.enerdata.net/electricity/electricity-domestic-consumption-data.html
4. Display the website on the front screen and show students how to navigate the site, explaining that it allows them to see how different countries have and continue to produce and use various sources of energy over the last 25 years. Give students a few minutes to explore the site on their own.
5. Ask students to get with a partner and assign each pair one country that is featured on the Global Energy Statistical Yearbook 2018 website. Explain to students that they will be gathering information from the site and using it to create an infographic that will inform people about how their country uses its energy resources and the reasons behind it.
6. Be sure to discuss with students how statistics can be misleading, and that in this case, information such as population size and the economic development of the country can be important to know when looking at energy use. For example, while China was the leading consumer of energy in 2017, they also are home to 1.4 billion people, while the U.S.—the 2nd highest consumer of energy has a current population of just 329 million. So, who's really using more energy per capita—or per person?
7. Provide students with the link to various free infographic creation websites, such as Piktochart (https://piktochart.com/) or Canva (https://www.canva.com/create/infographics/). Students should use the Global Energy Statistical Yearbook and other websites such as The World Factbook (https://www.cia.gov/library/publications/the-world-factbook/) to gather statistics and data about energy use and trends they see as important or interesting and information about the country such as population size, history, and resources.
8. Student pairs should use the remainder of the time to create their digital infographic. Infographic can then be printed off and displayed in the classroom for other students to view and discuss.

EXTENSION

As an extension of this activity, students could hold a mock "global energy summit," where they will act as representatives of their country and share information from their infographic with other countries (student pairs). Sitting with chairs or desks arranged in a circle and the teacher as the moderator, pairs will take notes on how other countries are using energy and a discussion and ideas of how countries may improve or decrease the energy consumption or how countries could work together to improve efficiency will be the culmination of the summit.

SOURCES

https://yearbook.enerdata.net/

https://www.cia.gov/library/publications/the-world-factbook/

https://www.youtube.com/watch?v=MFXtK6zSbEA

https://yearbook.enerdata.net/total-energy/world-consumption-statistics.html