
THE ENERGY DEBATE: A CASE FOR FOSSIL FUELS

Segment Length: 4:34 minutes

Lesson Description:

What are fossil fuels? Why do so many people dislike them? Are they bad for us? Are they bad for the environment? What are the alternatives? This segment looks at the debate over fossil fuels.

Concepts & Key Terms:

Fossil Fuels—Materials found in the ground that have been formed by the decomposition of dead organisms. Their high composition of carbon allows the materials to be burned for energy. Approximately 81% of the world’s energy comes from fossil fuels, including coal, natural gas, and oil.

Renewable Energy—Energy from sources that will not run out, such as biomass, solar, wind, and water power, including energy from rivers through the use of dams and turbines, and tides. Approximately 14 percent of our electricity comes from renewable sources.

Objectives:

Students will be able to:

- explain what fossil fuels are.
- differentiate between renewable and non-renewable energy sources.
- hypothesize the consequences of limiting the use of fossil fuels.

Preview Activity and Questions:

Distribute the K-W-L chart located at the end of the lesson (page 97). Have students complete the first two columns to the best of their ability. (Have them fill in the last column after viewing the video.)

Viewing Guide:

It is recommended that teachers show the video segment twice, once to allow students to view the video and focus on the issues presented, and once to allow them time to complete the viewing guide. After they complete the viewing guide, allow students a few minutes to work in pairs sharing and verifying answers.

Answers to Viewing Guide

1. lights
2. coal
3. irrigation
4. renewables

Name _____ Date _____

Class _____ Period _____ Teacher _____

The Energy Debate: A Case for Fossil Fuels Viewing Guide

Directions: As you watch the video, fill in the blanks with the correct words.

1. Fossil fuels help in the short-term. That's real. I mean I turn on the _____ every morning. That's real.
2. This is a piece of _____. Basically, all fossil fuel energy is, is it's taking this rock and figuring out how to use it to charge your iPhone or to power your car. I think that's amazing.
3. Drought used to be the biggest climate-related killer, but those deaths are way down because fossil fuels allow trucks to bring food to people who once starved and because farmers fight drought with fossil fuel powered _____ pumps.
4. They're actually building more coal capacity than ever to compensate for the _____ that they can't rely upon. Sometimes there's too much, sometimes there's too little. You want forms of energy that you can control, not that control you.

Now, take a few moments to reflect on the video and complete the K-W-L chart by yourself or with a partner. When you have finished, answer the questions below:

What is the main point of this video? _____

Do you agree or disagree? Why? _____

Discussion and Analysis:

1. Do you use fossil fuels? Which ones? In what ways?
2. Electricity is not a fossil fuel, but most electricity comes from fossil fuels. Where does our electricity come from?
3. Alex Epstein said that the fossil fuel industry “makes all of our lives possible.” Does it? Explain.
4. John Kerry, the Secretary of State at the time, asked what the harm would be by responding to global warming predictions even if they never materialize. Would there be any harm? Has trying to reduce the use of fossil fuels worked? Would anyone be harmed by reducing the use of fossil fuels?
5. Germany has been mining more coal and building coal-fired electric generating plants to replace the non-polluting nuclear power plants they are eliminating. Their plan is to use more renewable energy, but that isn’t working out so well. Are there any lessons in this for our country?
6. In an effort to advance wind and solar power, the government is giving millions of dollars to companies to develop better ways to generate renewable power efficiently. Should it? How are most products developed and improved?
7. Is there a significant difference between government giving our money to companies to experiment with energy sources and the companies using their own money? How do you think the government will decide which companies to support with tax dollars?
8. To save fish, the Sierra Club actively works to eliminate dams, many of which are used to generate electricity. If the result is to burn more pollution-generating carbon fuels, is their position self-defeating? Why/Why not?
9. Alex Epstein called the clip with Jimmy Fallon talking about hazelnut-powered cars one of the best arguments against solar, wind, and biofuels. Why?
10. It has been said that without energy, we’re living in the Dark Ages. What do you think about that? What has made our lives different from those who lived in the Dark Ages? Are our lives better or worse? What about our standard of living? Life expectancy? What have been some of the major factors in the changes from the Dark Ages to modern times?

Discuss These Lines from the Video:

1. These [fossil] fuels are far cheaper, more plentiful, more reliable.
2. Fossil fuels are absolutely essential.
3. Nature doesn’t give us a safe climate that we’re making dangerous. It gives us an incredibly dangerous climate that we’re making safe.
4. Even as the globe has warmed, climate-related deaths have dropped.
5. All the worst predictions, if they never materialize, what will be the harm that is done from having made the decision to respond to it?
6. Politicians give your money to people who sell wind power and solar power.
7. Europe tried that first. But then noticed the wind doesn’t always blow, and clouds sometimes block the sun. Electricity prices shot way up...
8. In the future, cars could be powered by hazelnuts. That’s encouraging, considering an eight-ounce jar of hazelnuts costs about nine dollars.

Quotes for Discussion:

The clear and present danger of climate change means we cannot burn our way to prosperity. We already rely too heavily on fossil fuels. We need to find a new, sustainable path to the future we want. We need a clean industrial revolution.

– Ban Ki-moon

The popular notion is that Americans are addicted to fossil fuels, but I find that's not true; most people would be happy to power their lives with anything else.

– Bill McKibben

Many anti-energy groups display little appreciation of the extent to which modern economies depend pervasively on the use of fossil fuels and petrochemical products.

– Robert Higgs

We should not just consume hydrocarbon fuel but use it to develop nuclear energy, hydro power and renewable energy sources.

– Vladimir Putin

I think so long as fossil fuels are cheap, people will use them and it will postpone a movement towards new technologies.

– Paul Krugman

I think the cost of energy will come down when we make this transition to renewable energy.

– Al Gore

I find it interesting that many of the people who want to restrict fossil fuels live in well-developed countries where abundant and affordable energy is readily available.

– Lee R. Raymond

A majority of American citizens are now becoming skeptical of the claim that our carbon footprints, resulting from our use of fossil fuels, are going to lead to climatic calamities. But governments are not yet listening to the citizens.

– John Coleman

If a power station were to be built down the road, I'd prefer a nuclear plant over an oil burner, and definitely over a coal burner. We simply have to lessen our consumption of fossil fuels.

– James Lovelock

The source of all the energy is the sun. The big challenge is, how do you use all of that energy? Solar power has to fascinate you. There have been strides to get the costs down, and if this will work, you have to get costs down so it is competitive with fossil fuels.

– George P. Shultz

The idea that human beings have changed and are changing the basic climate system of the Earth through their industrial activities and burning of fossil fuels – the essence of the Greens' theory of global warming – has about as much basis in science as Marxism and Freudianism.

– Paul Johnson

Activities:

1. Have students complete the K-W-L chart (page 97) that they began before watching the video.
2. Distribute copies of the Venn diagram (page 98) and have students complete in pairs or for homework.
3. Watch the full debate between Alex Epstein and Bill McKibben mentioned in the video.

https://www.youtube.com/watch?v=0_a9RP0J7PA

4. Show the class one of the streaming izzit videos listed in the Resources section.
5. In groups, research the arguments for or against fossil fuels, and conduct a classroom debate. To get students to look at fossil fuels from a different perspective, consider having them argue from a position with which they disagree. Students should be given time to research their position prior to debating. (See links in the Resources section for a guide to conducting classroom debates.)
6. Throughout a 24-hour period, list each time you use a fossil fuel-related energy. Then write an essay in which you discuss how much you depend on fossil fuels. In your conclusion, you might want to discuss what you could do to reduce your dependence on fossil fuels.
7. Research and prepare a slideshow comparing life in a country with little fossil fuel-based energy with life in a country with an abundance of fossil fuel-based energy. (See links in the Resources section for help in preparing effective slideshows.)
8. Solyndra was an American company that produced solar panels. It received a \$535 million loan from the U.S. government. Research Solyndra and the results of that loan.
9. Who is Alex Epstein and what is the Center for Industrial Progress? Where does his organization get its funding? Research and write a report about them.
10. What are the negative effects of using fossil fuels? Research this and present your findings on a poster board or in a slideshow. (See links in the Resources section for help in preparing effective slideshows.)
11. Conduct the classroom activity: How Much Does it Cost to Light Your School?
http://energy.gov/sites/prod/files/How_Much_Does_It_Cost_to_Light_Your_Scho.pdf
12. Research the efficiency of renewable and non-renewable energy sources. Why has renewable energy not become more widespread? Report your findings in an essay.
13. Read one of the articles in the Resources section and either write a summary of it or take Cornell Notes as you read the article. (See links in the Resources section for help in taking Cornell Notes.)
14. Leonardo DiCaprio is an outspoken critic of fossil fuels. Research the actor and his position on fossil fuels, and the criticisms of him. Is there anything hypocritical about his efforts to limit fossil fuels?
15. In an essay, present both sides of the fossil fuel debate. Use statistics and other facts to form an opinion on which side of the debate has more credibility. Explain why you give more weight to the evidence presented on one side versus the other.
16. Write and produce a public service announcement (PSA) in which you support or oppose fossil fuels. Be sure to advocate strongly for the side you take, using evidence to support your position. The PSA may be presented as a video (TV spot), audio (radio spot), PowerPoint presentation, or on a storyboard. The PSA may be a group or individual project.
17. Read Alex Epstein's book, *The Moral Case for Fossil Fuels*, and write a book report about it. (See links in the Resources section for help in writing persuasive essays.)
18. Watch "The Moral Case for Fossil Fuels with Alex Epstein" and write an essay about his argument.
https://www.youtube.com/watch?v=nYCg_6v140U
19. In a five-paragraph persuasive essay, argue in favor of or against the use of fossil fuels. Make sure to include your thesis statement in your introduction, and in one of your body

paragraphs, explore the opposition's argument and the reasons you think they are wrong. (See links in the Resources section for help in writing persuasive essays.)

20. Watch one of the izzit videos listed in the Resources section Then either write a five-minute summary talk to explain the article to your class or submit your summary to your teacher. For help in speaking to a class:

<https://www.hamilton.edu/oralcommunication/tips-for-effective-delivery>

21. Watch Alex Epstein's testimony before the Senate's Environment and Public Works Committee and take Cornell notes as you watch it.

<https://www.youtube.com/watch?v=R5KoYJ64vjA>

22. Produce a "man-on-the-street" video in which you ask people if they know what fossil fuels are and what they know about the benefits and drawbacks of fossil fuels. (See links in the Resources section for help in producing man-on-the-street videos.)

23. Write a letter to your U.S. Senators or Congressional Representative about limiting the use of fossil fuels or about federal government funding of alternative energy. (See links in the Resources section for help in writing to your elected officials.)

24. Watch the video, "Matt Ridley on How Fossil Fuels are Greening the Planet," and report back to the class

https://www.youtube.com/watch?v=S-hsU_DalZE

Resources:

A good explanation of K-W-L, with a sample chart, and a chart for downloading:

<http://www.readingquest.org/strat/kwl.html>

Also helpful for K-W-L:

<https://www.teachingchannel.org/videos/think-pair-share-lesson-idea>

For suggestions about preparing effective slideshow presentations:

http://www.slideshare.net/satyajeet_02/how-to-make-effective-presentation

<https://support.office.com/en-us/article/Tips-for-creating-and-delivering-an-effective-presentation-f43156b0-20d2-4c51-8345-0c337cefb88b>

<http://smallbiztrends.com/2016/07/effective-powerpoint-presentations.html>

For a clear, simple explanation of the Cornell note-taking system:

<http://coe.jmu.edu/learningtoolbox/cornellnotes.html>

<http://www.bucks.edu/~specpop/Cornl-ex.htm>

For help in conducting classroom debates:

<http://712educators.about.com/cs/lessonsss/ht/htdebate.htm>

http://www.edu.gov.mb.ca/k12/cur/socstud/frame_found_sr2/tns/tn-13.pdf

<http://busyteacher.org/7245-conducting-class-debate-essential-tips.html>

How to write a biography:

<http://www.infoplease.com/homework/wsbiography.html>

<http://homeworktips.about.com/od/biography/a/bio.htm>

How to write a persuasive essay:

https://www.scribendi.com/advice/how_to_write_a_persuasive_essay.en.html

<http://www.infoplease.com/homework/writingskills7.html>

To find out who your congressional representative is:

<http://www.house.gov/representatives/find/>

How to write a letter to your elected representative:

<http://www.americantrails.org/resources/advocacy/lettersAlbright.html>

<http://www.wikihow.com/Address-a-Letter-to-a-Government-Official>

http://usgovinfo.about.com/c/ht/00/07/How_Write_Letters_Elected0962932964.htm

How to produce a man-on-the-street interview:

<http://onemarketmedia.com/2009/02/16/seven-ideas-to-help-get-the-most-out-of-a-man-on-the-street-interview/>

<http://watchdogwire.com/blog/2014/08/25/man-on-the-street-interview-tipsheet/>

How to produce a PSA:

<http://www.samhsa.gov/sites/default/files/tips-for-creating-own-psa.pdf>

<http://www.slideshare.net/kaitlinireland/how-to-guide-psas>

How to produce persuasive videos:

<http://ezinearticles.com/?Video-Marketing—Making-a-Persuasive-Video&id=3267249>

Articles

“Carbon Polluters Fund XPrize to Repurpose Their Emissions” by Peter Fairley

<http://spectrum.ieee.org/energywise/energy/fossil-fuels/carbon-polluters-fund-xprize-to-repurpose-their-emissions>

“Energy Insider Claims DiCaprio Burns A Lot More Fossil Fuels Than He Lets On”
by Chris White

<http://dailycaller.com/2016/03/01/energy-insider-claims-dicaprio-burns-a-lot-more-fossil-fuels-than-he-lets-on/>

“Fossil Fuels Will Save the World (Really): There are problems with oil, gas and coal, but their benefits for people – and the planet – are beyond dispute” by Matt Ridley

<http://www.wsj.com/articles/fossil-fuels-will-save-the-world-really-1426282420>

“Leonardo DiCaprio Foundation Donates Another \$15 Million for Conservation Efforts as His Fight Against Climate Change Continues” by Jodi Guglielmi

<http://www.people.com/article/leonardo-dicaprio-davos-fossil-fuel-elimination>

“The Poor Need Cheap Fossil Fuels” by Bjorn Lomborg

<http://www.nytimes.com/2013/12/04/opinion/the-poor-need-cheap-fossil-fuels.html>

“Renewable Energy is Good for Your Health” by Monica Heger

<http://spectrum.ieee.org/energywise/energy/environment/renewable-energy-is-good-for-your-health>

“Wind and Solar Are Crushing Fossil Fuels: Record clean energy investment outpaces gas and coal 2 to 1” by Tom Randall

<http://www.bloomberg.com/news/articles/2016-04-06/wind-and-solar-are-crushing-fossil-fuels>

Videos

Alex Epstein testifies before a Senate committee on fossil fuels

<https://www.youtube.com/watch?v=R5KoYJ64vJA>

Cool It!: Are we saving the world or just burning money?

<http://lizzit.org/streaming/>

Energy Solutions: Unintended consequences of energy decisions.

<http://lizzit.org/streaming/>

Matt Ridley on How Fossil Fuels are Greening the Planet

https://www.youtube.com/watch?v=S-nsU_DalZE

The Moral Case for Fossil Fuels with Alex Epstein

https://www.youtube.com/watch?v=nYCG_6v140U

People, Power & Prosperity: Electricity makes a big difference.

<http://lizzit.org/streaming/>

Philosopher Alex Epstein champions fossil fuels at the Senate EPWC – complete testimony and Q&A

<https://www.youtube.com/watch?v=R5KoYJ64vjA>

Power to the Planet: Pros/Cons of available energy sources.

<http://lizzit.org/streaming/>

Websites

What You Need to Know About Energy:

The National Academies of Sciences • Engineering • Medicine

<http://needtoknow.nas.edu/energy/energy-sources/>

Fossil Fuels to Products – A well-developed lesson about fossil fuels

http://www.shell.us/about-us/features-and-highlights/enlists-teachers-to-address/_jcr_content/par/textimage.stream/1434570858102/aba10a6290de7c23dab7ee053b081a065eff19177aaa9db3854ddd645f3742c6/eyf-fossil-fuels-to-products.pdf

Lesson Plan: The Energy Problem

<https://www.clarkson.edu/highschool/k12/project/documents/energysystems/1-The-Energy-Problem.pdf>

U.S. Department of Energy- A one-page explanation of the origin of fossil fuels:

http://energy.gov/sites/prod/files/2013/04/f0/HS_FossilFuels_Studyguide_draft1.pdf

U.S. Department of Energy- Activity: How Much Does It Cost to Light Your School?

http://energy.gov/sites/prod/files/How_Much_Does_It_Cost_to_Light_Your_Scho.pdf

U.S. Department of Energy- A seven-page explanation of oil drilling:

http://energy.gov/sites/prod/files/2013/04/f0/HS_Oil_Studyguide_draft2.pdf

Books

Fueling Freedom: Exposing the Mad War on Energy by Stephen Moore and Kathleen Hartnett White

The Moral Case for Fossil Fuels by Alex Epstein

Organizations

American Council on Science and Health

<http://www.acsh.org/>

American Enterprise Institute

<http://www.AEI.org>

Center for Industrial Progress

<http://industrialprogress.com/>

Institute for Energy Research

<http://www.instituteforenergyresearch.org>

The Heartland Institute

<http://www.heartland.org>

Name _____ Date _____

Class _____ Period _____ Teacher _____

The Energy Debate: A Case for Fossil Fuels K-W-L Chart

Directions: Complete the **K** and **W** sections prior to watching the video. After you have seen the video, complete the **L** section and answer the two questions below the K-W-L chart.

K	W	L
What I think I know about fossil fuels:	What I want to know about fossil fuels:	What I've learned about fossil fuels:

What is one argument in favor of fossil fuels?

What is one argument against fossil fuels?

Name _____ Date _____

Class _____ Period _____ Teacher _____

The Energy Debate: A Case for Fossil Fuels Venn Diagram

Directions: Complete the Venn Diagram to compare and contrast fossil fuels and renewable energy resources.

