College Guild
PO Box 6448, Brunswick ME 04011

ENVIRONMENTAL ISSUES

UNIT 5 OF 5

Fresh Water and Energy

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Fresh Water

How long can someone live without fresh water? In most cases, three days is the limit, though there have been a few instances where people have survived for a week or more. Either way though, consistent access to clean, fresh water is essential to a healthy life. Many people don't have this access. Currently, four billion people, that's two thirds of the world's population, suffer from severe water shortages at least one month out of the year. About 130 million of these people live in the United States, mostly in Florida or the southwest from Texas to California. Close to one billion people worldwide experience water shortages year-round.

1. If you suddenly found yourself without access to clean, fresh water in a city, what would you do? What about if you lived in the country?

When people don't have access to clean water, they resort to whatever water is available. In the Third World, people, usually women, spend hours each day retrieving water from far away streams which may be polluted with agricultural or industrial runoff or human or animal waste. In the United States, the major problem is high levels of lead in the water, either from lead pipes or contaminated public water supplies. Although there has been much progress in solving this problem, it still remains in thousands of neighborhoods across the country. Regular consumption of polluted water leads to a wide range of serious health problems, especially among young children and pregnant women.

There are many reasons for the shortage of clean water. Large farms and factories throughout the world use more water than they need to and often pollute nearby lakes and streams when disposing of it. Droughts, due in part to climate change, are occurring more frequently and lasting longer. The picture below shows a former lake in California.

The Aral Sea in central Asia, once the fourth largest lake in the world, has shrunk to one tenth of its original size after several rivers feeding it were dammed to provide irrigation water for farms. Here are two aerial photographs of it, the one on the left was taken in 1989, the one on the right in 2014.

2. What are some of the ways in which water is wasted in your institution? What can be done about it?

3. What are some of the ways in which fresh water is wasted in American society as a whole? What can be done about it?

4. Write a short story or poem about a person lost in the desert with a limited supply of water. You can write from of the perspective of the person, a desert animal, or the desert itself.

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Energy

Many of the world's environmental problems can be traced to where we get the energy to power our economies. As we mentioned in Unit 2, most energy is produced by burning fossil fuels – coal, oil, and natural gas – which results in the emission of greenhouse (or heat trapping) gases, causing a gradual, but persistent warming of the earth. The burning of fossil fuels also results in a more noticeable problem – air pollution which causes high rates of asthma and other respiratory illnesses among those who live near power plants, factories and oil refineries. In most cases, these are low income people who can't afford to live in more desirable, less polluted neighborhoods.

While the problems with fossil fuels are well known, there are no easy answers for how to deal with them. One reason is that fossil fuels are extremely effective at providing people in the 21st Century many things which we take for granted – the ability to drive hundreds of miles in a single day, for example, or to stay comfortably warm in the winter and cool in the summer. Two hundred years ago, it was not uncommon for people to spend their whole lives within twenty miles of where they were born.

5. Name five "creature comforts" made possible by abundant energy which would be very scarce, or even nonexistent, if this energy were no longer available.

6. Which of these would you miss the most and why?

7. Pick a time before the energy produced by fossil fuels was widely available. If you went back in time to that era, where would you want to live and why? What job would you choose and why?

8. Write a letter to a friend from this century describing the living conditions and what you like least and most about living in that era.

Complex problems often require complex solutions. In this case, the problem is how to reduce or eliminate the damage caused by the burning of coal, oil, and gas while retaining as many of the benefits which these fuels provide as possible. There are two broad approaches to solving this problem. Neither approach will be adequate by itself – each is necessary. The first approach involves reducing the demand for energy. One way to do this is through increased efficiency. Through a combination of Federal regulations and technological improvements, the average fuel economy for new passenger cars almost doubled from 18 miles per gallon in 1978 to 35 mpg in 2015. There have been similar improvements in household appliances, such as refrigerators and stoves, as well as in a wide variety of industrial processes.

Another way of reducing the demand for energy is to reduce waste. For example, about forty percent of the food produced in the United States is wasted – not eaten by humans or animals. This means that the energy used to produce that food, to process it and to transport it to stores and restaurants is also wasted.

9. Have you noticed much food waste in your facility? If so, what would you suggest doing about it?

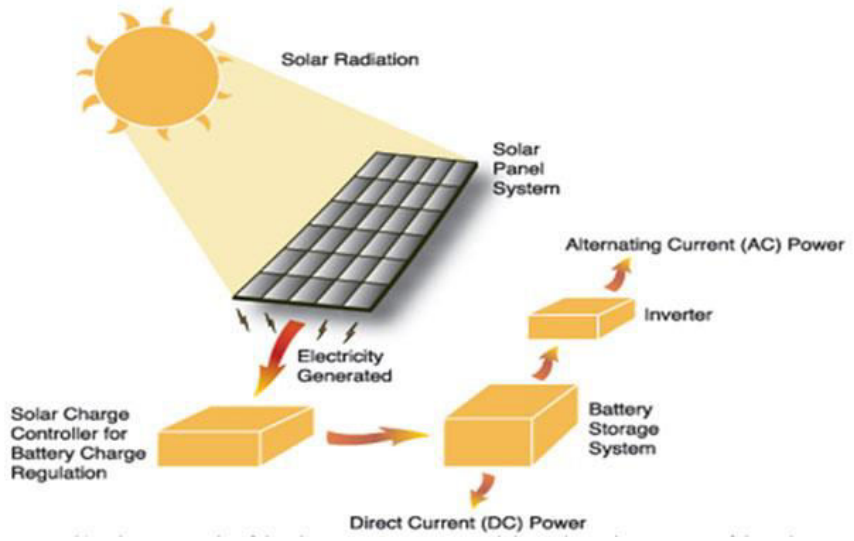
10. What are some ways to reduce the amount of food wasted in our society as a whole?

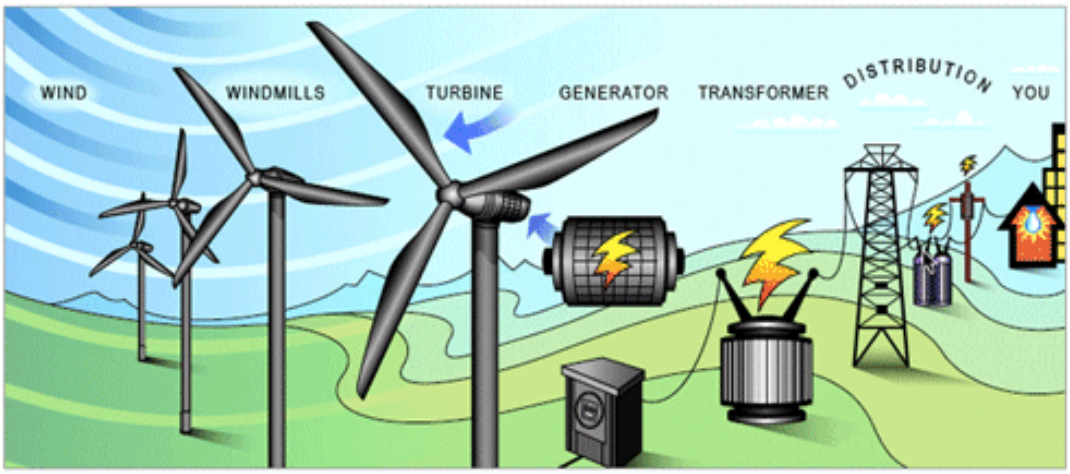
The second approach to solving the energy problem is to expand the use of alternative energy sources - ones without the harmful environmental consequences of fossil fuels. These include solar power, which uses photovoltaic panels to convert the rays of the sun into electricity, and wind power, in which the flow of air through wind turbines (large blades) mechanically powers generators to produce electric power. Both of these technologies have been around for decades as sources of electricity and, in fact, wind power has been used to ground grain, pump water, and propel ships for thousands of years. Research in recent years, stimulated by increased concerns about fossil fuel emissions, has resulted in technical advances and reduced costs for both solar and wind.

Solar energy installations come in all sizes, from rooftop panels on individual homes to large solar farms covering thousands of acres in desert areas. Similarly, a few wind towers can power a small farm while large wind farms can consist of hundreds of towers along ridge lines or on windy plains. Wind farms are also being built at sea, where the wind is more consistently available than it is on land.

One of the drawbacks of both solar and wind is that they are *intermittent*. Unlike power generating plants fueled by coal or natural gas, which can operate at any time, they only produce electricity when the sun is shining or the wind is blowing. To address this problem, researchers are looking into advanced battery systems and other means of storing the electricity from the time when it is produced until the time when it is needed.

The graphics on the next page provide overviews of how solar and wind power work.





Here are some photographs of solar and wind power installations.

Both solar and wind power have their critics. Some people are concerned about the impact on wildlife when wind towers are built on remote mountain tops or solar farms are located in ecologically sensitive desert areas. Other people – or sometimes the same ones – object on aesthetic grounds. They think the towers or panels are ugly and spoil the view.

11. If your job were to persuade a group of local residents to accept a solar or wind project in their area, how would you go about doing so?

Solar and wind, along with more exotic alternative energy sources like tidal and geothermal power, have made great strides in recent years but they are still a long way from completely replacing coal, gasoline and natural gas. Our society has become too accustomed to fossil fuels' ability to deliver concentrated energy whenever and wherever it's needed. Many people though are working hard to speed the transition to more sustainable and environmentally friendly ways of providing power to the people.

As we've seen, the major environmental problems are complex and closely related to each other. They are also related to other issues which we don't normally think of as being "environmental". While most people can agree that it is important to protect the natural world from further harm and to restore as many as possible of those areas where the harm has already been done, attempts to do this often seem to conflict with accomplishing other worthwhile goals. Some people, for example, are concerned that strict laws and regulations to protect the environment will impede economic growth and the creation of new jobs. Also, some are concerned about having government adopt environment–friendly policies which, in their opinion, may limit individual citizens' personal freedom. There isn't a single right answer to these conflicts. Much depends on the details of each specific situation and it's often necessary to find a compromise between competing priorities and values.

12. What are some possible laws or requirements that you think it is legitimate for governments to impose on private citizens in order to protect the environment? Explain your answer.

13. What are some possible laws or requirements to protect the environment that are not reasonable? Explain your answer.

14. What are some possible laws or requirements that you think it is legitimate for governments to impose on companies in order to protect the environment? Explain your answer.

15. What are some possible laws or requirements that are not reasonable? Explain your answer.

16. The election of Donald Trump as president in 2016 has resulted in many changes in the policies of the Federal Government. What are some of these changes with regard to the environment? Will they help or hurt the environment and how?

So far in this course we have been talking primarily about problems – climate change, ocean acidification, water pollution, and so on. It's important to understand these problems if we are to deal with them effectively. But it's also important to recognize that we humans are not helpless in the face of them – that there are steps that we can take to solve them, or at least to minimize their impact. These steps range from individual lifestyle changes to international political agreements. And people around the world are taking these steps.

Environmental Issues is a new College Guild course, so your feedback is doubly welcomed and valuable.

17. What were you least and most favorite things about the course? How could it be improved?

18. Write another assignment for students taking Environmental Issues.

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Remember: First names only & please let us know if your address changes