

Green Matters

DPW Environmental and Natural Resources



The Environmental Impacts of Electricity^{1,2}

Electricity... its all around us, but we don't see it. We can feel its presence every time we walk into a room and flip a switch. We can feel its warmth on a cold winter day and the coolness in the hot summertime. How often do we go about our daily tasks never to think twice about how the use of electricity affects the environment?

Of all the energy used by Americans, roughly 39% is used to generate electricity. Fossil fuels, such as coal, natural gas, and oil aid in the generation of electricity in the United States.

Natural Gas "Natural gas is a fossil fuel formed when layers of buried plants and animals are exposed to intense heat and pressure over thousands of years." Wells are drilled into the ground to extract the natural gas, and then it goes thru a purification process. Once that is completed, it is then transported via pipelines to the power plants for combustion. Once the gas is burned in a boiler, steam is produced which powers the steam turbine to produce electricity.



Benefits:

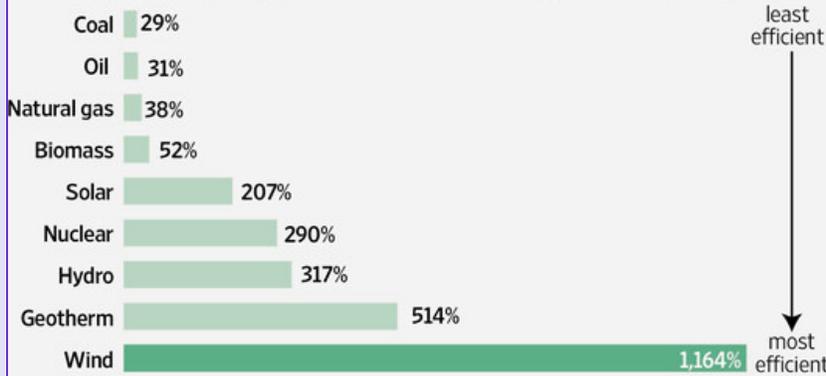
- Plentiful and inexpensive
- A reliable source
- Less pollution and waste than coal
- It is inexpensive and quick to build natural gas plants.

Impacts on the Environment:

- Causes air pollution and green house gases are emitted.
- Extraction of natural gas is destructive to environment
- Large amounts of water are used

Energy Efficiency

Percentage of energy input retained when converting fuel to electricity



Upcoming Training:

- Feb. 4– Hazardous Waste Refresher, 0830;0945, Bldg 11307
- Feb.11-12 Hazardous Waste Management Course, 0800-1600; Bldg 11307
- Feb. 18– Stormwater Industrial Training , 0900-1300;Bldg 11307
- Mar. 4– 2nd QTR FY15 EQCC Meeting, 1300-1400: Darling Hall, GC Conf Rm
- Mar. 12– Hazardous Waste Refresher, 0830;0945, Bldg 11307



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Nuclear Energy Nuclear energy is formed by fission-the process of splitting uranium atoms. It releases energy that is used to make steam, which powers the generator to make electricity. In the United States, 20 percent of electricity is produced by nuclear energy. There are more than 100 nuclear generating units operating in the country today. Uranium is mined and is a nonrenewable resource. After it is obtained it is concentrated into an enriched fuel (uranium oxide pellets) and transported to the nuclear power plant.



Benefits:

- No air pollution or greenhouse gases emitted
- A reliable source
- Uranium is plentiful all around the world.
- There is very little impact on environment during the generation of electricity.

Impacts on the Environment:

- No safe disposal of nuclear waste(radioactive)
- Serious health and safety risks in the generation process
- The mining of uranium is destructive to the environment (water pollution, erosion, land damage).
- Involves the use of large quantities of water and thermal discharge
- Uranium is a non-renewable resource
- Nuclear plants are costly and time consuming to build. The Darlington Nuclear Plant in Ontario took 10 plus years to build at a cost of \$15 billion. Nuclear waste disposal is very expensive.

Oil Power The process of burning oil, a fossil fuel, to heat water to produce steam which powers a steam turbine or burn the oil in a combustion turbine to produce electricity. Another method called the combined cycle is used. This is simply combining the two methods together which in turn is the most efficient.



Benefits:

- It is inexpensive and plentiful source of electricity
- A reliable source of electricity

Impacts on the Environment:

- Causes air pollution and green house gases are emitted
- Uses large quantities of water and leads to water pollution and thermal discharge
- Toxic sludge and solid waste is a by product
- A non renewable resource

Hydroelectric Power is simply using the power of water to create electricity. Water must be falling from a higher point in order to harvest the energy from the water as it turns turbines to create electricity in generators. This strategy involves the use of dams or canals also known as run-of-river-systems.



Benefits:

- No air pollution or greenhouse gases emitted
- Water is plentiful and free
- Inexpensive
- Renewable electricity source

Impacts on the Environment:

- Constructing dams and reservoirs can lead to flooding, habitat destruction, alter waterways and disrupt fish habitats
- Can be expensive to construct large scale power plants
- Smaller systems effected by seasonal flows and freezing water

This day and time people tend to be getting in shape and staying healthy. Shopping for the healthiest foods and staying active are at the top of the list to a healthy lifestyle. Much emphasis is put on the quality of food that we eat, but how much thought is put into the type of cookware that we use and the containers that we store our healthy foods in? Some of the kitchenware that we use today have the potential to release toxins into our food and into the air. Over time, these small quantities can build up in our bodies which can be harmful to our health.

Pots and Pans

Nonstick cookware



Nonstick cookware has made American cooks very happy. Food doesn't stick, and the clean up is easy. As convenient as it might be, there are toxins lurking in the coatings of these nonstick surfaces. Teflon is the special coating put on some cookware, also known as PTFE. Teflon can release toxic fumes that have shown in studies to cause flu-like symptoms in people and can be deadly to birds. Toxins can also leach directly into the food as well. Perfluorooctanoic acid (PFOA) is a chemical that is used in the making of PTFE and is known for its carcinogenic traits. Research has shown that PFOA can make you more susceptible to have high cholesterol levels, thyroid disease and infertility. The FDA (Food and Drug Administration) has stated that PTFE used as nonstick coating is safe when used properly. Scientist on the other hand aren't convinced of that and believe that more research is needed. Keri Glassman, a certified nutritionist and founder of Nutritious Life in New York City, believes you should err on the side of caution. "Although these chemicals in nonstick surfaces are in very small amounts, they do still stay in our bodies. And that's not to scare people, your are getting a teeny bit in there. But when there are other great options out there, you have a choice," Glassman stated to FoxNews.com. There are safer alternatives to consider:

Cast Iron



One of the safest alternatives is cast iron which has no harmful chemicals to be released into your food or the air. It is PTFE and PFOA free. The only thing that could absorb into your food is the mineral iron. Glassman states, "You're not going to get those chemicals in your food with cast iron. What you will get, even if you scrape it at the bottom a bit , is a little bit of iron, which is a good thing!" Another great advantage to cast iron is that there is no heat limits, and it can be put on top of the stove as well as in the oven which you can NOT do with nonstick pots and pans.

Stainless Steel



Another safe choice would be stainless steel. It resist corrosion ,and the surface doesn't flake off and contaminate your food like a lot of nonstick cookware can do. The metals that make up stainless steel cookware are carbon, chromium, nickel and/or manganese. It is a possibility that some lower grade stainless steel cookware could leach small amounts of nickel into your food. It is recommended to purchase the higher quality stainless steel products to avoid this. Gunter Wilhelm is a good brand for high quality stainless steel cookware.

Food Containers

Plastic

As convenient as plastic containers are to use, they also hold hidden dangers. Plastic containers contain chemicals such as Bisphenol (BPA), Polyvinyl Chloride (PVC) and phthalates that can also leach into your food. Research has shown, according to Mr. Glassman, that plastics containing BPA have been linked to cancer, poor brain health, and poor heart health. He recommends to get rid of any plastics in the kitchen that contain BPA . He also notes that you should NOT heat any foods in the microwave in plastic containers as this increases the release of the harmful toxins into your food. Also when plastic comes in contact with acidic, fatty or salty foods, leaching can increase.



Glass

Glass would be a much safer option to store food in and is safe to microwave. No toxins are leached into your food from glassware. Also, recycling glass is more environmentally friendly, has a longer lifespan, and in the end saves you money.⁶





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Sources:

- 1-<http://www.epa.gov/cleanenergy/energy-and-you/affect/nuclear.html>
- 2 <http://www.ecospark.ca/wattwise/students/nuclear>
- 3-<http://www.whitehouse.gov/blog/2011/07/29/president-obama-announces-new-fuel-economy-standards>
- 4-<http://www.whitehouse.gov/the-press-office/2012/08/28/obama-administration-finalizes-historic-545-mpg-fuel-efficiency-standard>
- 5-<http://www.whitehouse.gov/sites/default/files/docs/finaltrucksreport.pdf>
- 6-<http://www.foxnews.com/health/2014/05/23/dangerous-kitchenware-lurking-in-your-home/>

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Compliance Corner

In July of 2011, the Obama administration announced the new fuel efficiency standards ,under the Climate Action Plan, of being set to 54.5mpg by 2025. These new standards apply to cars and light trucks for Model Years 2017 to 2025. This will help reduce greenhouse gas emissions to 163 grams per mile. In combination with the previous standards set ,consumers are expected to save \$1.7 trillion at the pump and reduce the country's oil consumption by 12 billion barrels.^{3,4,5}

"These fuel standards represent the single most important step we've taken to reduce our dependence on foreign oil, said **President Obama**.⁴ "This historic agreement builds on the progress we've already made to save families money at the pump and cut our oil consumption. By the middle of the next decade our cars will get nearly 55 miles per gallon , almost double what they get today. It'll strengthen our nation's energy security, it's good for middle class families and it will help create and economy built to last."

Our environment will see a reduction of carbon monoxide pollution by over 6 billion metric tons(that alone is equivalent to what the US emitted last year). Our air will be cleaner with less pollutants such as smog and soot. Developed in combined efforts with the auto industries, the State of California, the United Auto Workers (UAW), national environmental organizations and other stakeholders, the new fuel efficiency standards will bring the nation over 50% closer to the President's goal of reducing oil imports by a third by 2025.^{3,4}

OBAMA ADMINISTRATION Fuel Economy Standards In the year 2025

The fleet-wide average will be
54.5 MPG

Consumers will have saved
\$1.7 TRILLION
at the pump over the
life of the program.

A family that purchases a new
vehicle in 2025 will save
\$8,200
in fuel costs when compared with
a similar vehicle in 2010.

Over the life of the program, the standards will:

Save **12** billion
barrels
of oil.

Eliminate **6** billion
metric
tons
of carbon dioxide pollution.

This program, together with standards already put into place by this
administration for Model Years 2011-2016, will result in significant
cost savings for consumers at the pump, dramatically reduce oil
consumption, cut pollution and create jobs.

