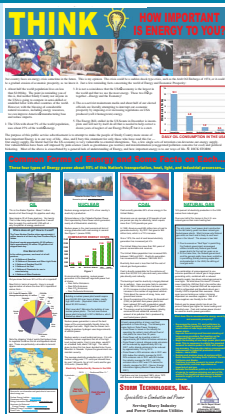




# WANT JOBS? THINK NEW POWER PLANTS!

**Let's Build New Coal and Nuclear Power Plants in North Carolina!**  
**A major new Coal or Nuclear Power Plant has not been built in N.C. in more than 20 years!**



Congress needs to pass an energy bill this year. Coal and nuclear must be respected and new plants built in this decade. Storm Technologies, Inc. serves the electric power and heavy industries that utilize large amounts of fossil fuels. As a public service we are presenting three advertisements this winter: the first was published on December 28<sup>th</sup>, 2003, and it outlines where 95% of our energy comes from and how it is utilized. If anyone missed getting a copy, we will be pleased to e-mail you a PDF version. It is shown in reduced size to the right.

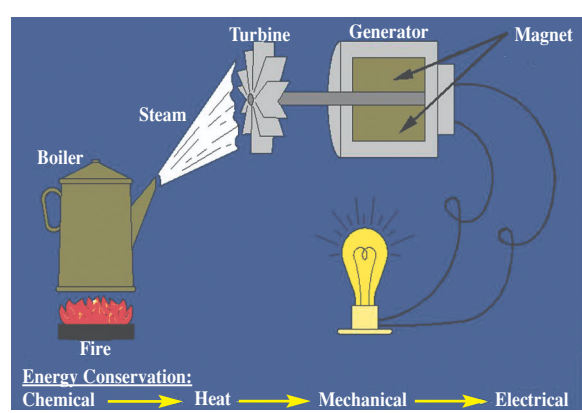
For this issue we have chosen to answer the questions: "How is electricity generated?" and "What are the different forms of energy?" The next issue will feature: "Why do we need a comprehensive energy policy?"

## HOW IS ELECTRICITY GENERATED?



Power generation for 52% of our nation's electric power begins at a coal pile and is processed into electric power in clean coal fired power plants, such as pictured on left.

The coal is blown fine as powder through burners such as this one shown below:



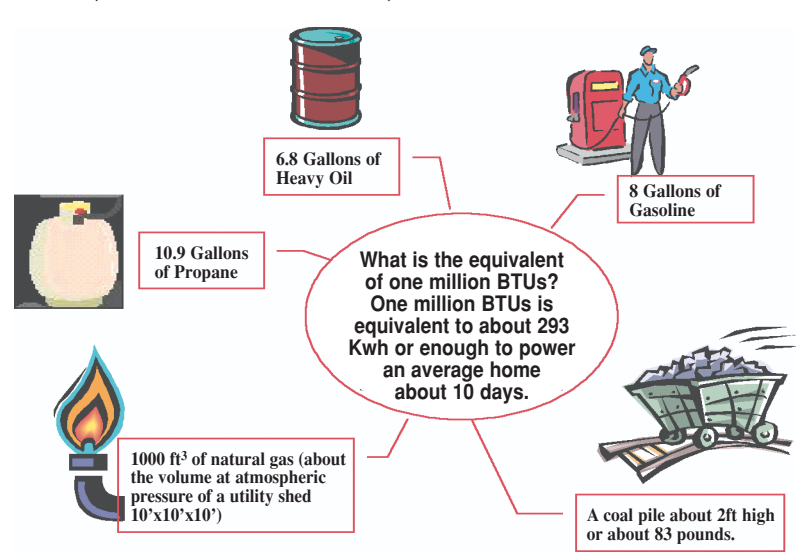
Here is a simplified illustration of how a "steam" power plant converts the chemical energy of coal into "heat," then into steam and mechanical energy, and then into electrical energy.



A typical large utility boiler may have up to 96 burners such as this. The average 500MW power plant will consume about 2 railroad coal cars per hour.

## What are the different forms of energy?

Most "Energy" is utilized for transportation. Nearly all (other than nuclear) forms of energy are converted from "potential chemical" to "heat" to "mechanical energy." Therefore, as one business sector uses more of one form of energy, it impacts the demand and price of that form of energy. For example: as more natural gas is used for electric power generation, it greatly increases the demand and eventually the price of natural gas for home heating or industry. The illustration below is intended to be a simplified version of the energy equivalence of a million BTU's (BTU = British Thermal Unit) in different fuels:



## COMMON FORMS OF ENERGY AND SOME FACTS ON EACH...

These four types of Energy power about 95% of this Nation's transportation, heat, light, and industrial processes...



**OIL**

This is the Alaska Pipeline. About 1 million barrels of oil flow through this pipeline each day.

Now imagine 20 of these pipelines. Yes twenty. That is how many equivalent pipelines it would take to supply the continental USA with oil – only the portion of energy used as oil.

**Where does oil go? How is it used?**

The Trans Alaskan Pipeline ships approximately 1 million barrels of oil each day from Prudhoe Bay to Valdez.

One barrel equals approximately 42 US gallons – that's approximately 42 million US gallons of oil shipped each day.

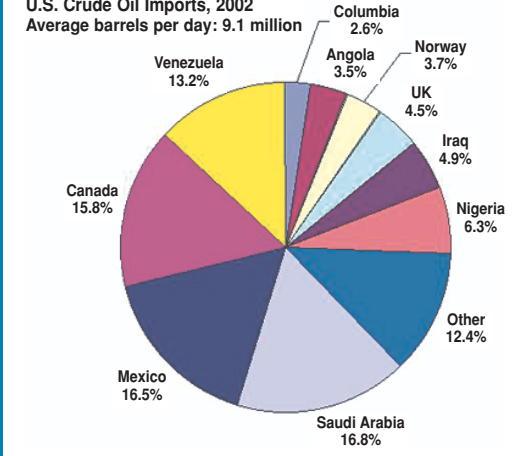
**One Barrel of Oil:**

In the refining process, one barrel of oil will produce:

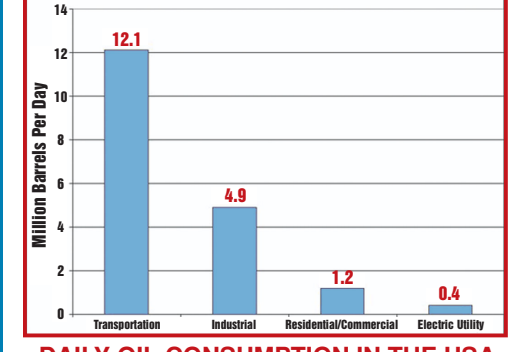
- 18 Gallons of Gasoline
- 10 Gallons of Kerosene and Other Light Fuels
- 5 Gallons of Residual Fuel Oil
- 3 Gallons of Jet Fuel
- 2 Gallons of Chemicals for use in manufacturing
- 2 Gallons of Other Products

Did you know that over 50% of this oil is imported?

Now think in terms of security. Here is a rough approximation of where the over 50% imported oil comes from...

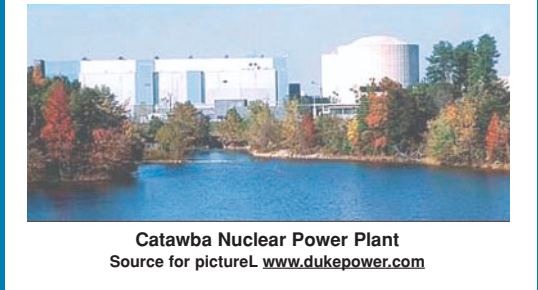


Most, but not all, fuel oil is used for transportation. By the way, when eco-activists talk about air pollution and CO<sub>2</sub> production. This is directly related to the quantities of fuel utilized.



Sources for our information and great sites to learn more about energy are:

- Nuclear Energy Institute – [www.nei.org](http://www.nei.org)
- Department of Energy – [www.doe.com](http://www.doe.com)
- Energy Information Administration – [www.eia.doe.gov](http://www.eia.doe.gov)
- Americans for Balanced Energy Choices – [www.balancedenergy.org](http://www.balancedenergy.org)
- National Energy Foundation – [www.natenergy.org](http://www.natenergy.org)
- Fossil Fuels – [www.fossilfuels.org](http://www.fossilfuels.org)

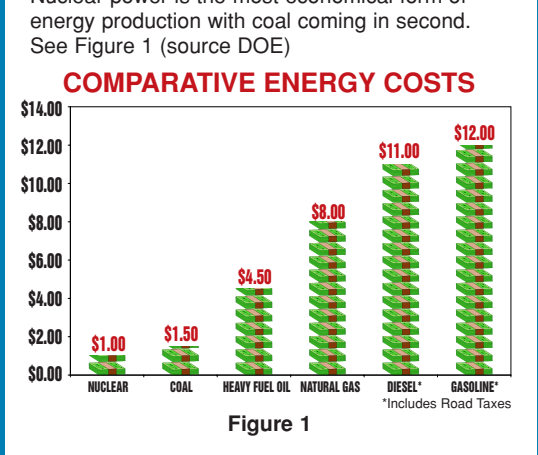


**NUCLEAR**

Nuclear energy comprises 21% of our country's electricity's production.

Pictured above is the Catawba Nuclear Power Plant operated by Duke Power which generates nearly all of Albemarle's electricity.

Nuclear power is the most economical form of energy production with coal coming in second. See Figure 1 (source DOE)



Environmentally speaking, nuclear power generation is the cleanest large bulk power fuel of choice

- Zero Sulfur Emissions
- Zero NO<sub>x</sub> Emissions
- Zero CO<sub>2</sub> Emissions
- Zero Particulate Emissions

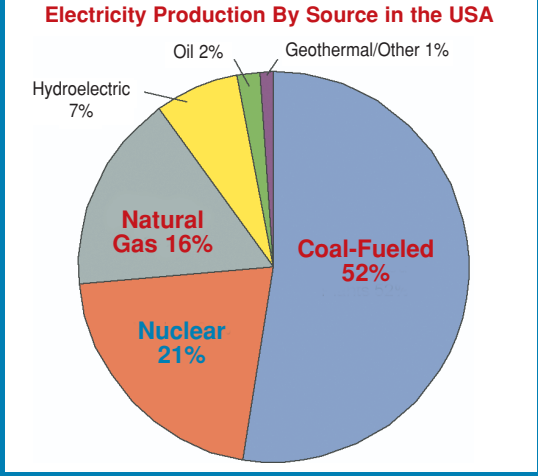
Building a nuclear power plant would require over 50,000,000 man hours of labor, mostly high skill levels. (Equivalent labor to build about 50,000 homes.)

Want new jobs? Welcome the building of new nuclear power plants. The last new nuclear power plant to be built in NC is McGuire, which started up about 1985.

Nuclear power generation is one of the best hopes of the environmentally friendly future for hydrogen fuel cells. Right now the known technology to produce hydrogen uses large amounts of electric power.

Nuclear waste is a well publicized issue. It is estimated by nuclear engineers that all of the high level nuclear waste, if put in one place, would fit on a football field, about 15ft high. The safest place to store this has been decided to be Yucca Mountain in Nevada. A place the government can maintain security.

The average electricity production cost in 2002 for nuclear energy was 1.71 cents per kilowatt-hour, for coal 1.85 cents, for oil 4.41 cents and for gas 4.06 cents. (Source NEI)



**COAL**

Coal currently provides 52% of our energy in the United States.

Americans use an average of 20 pounds of coal per person per day for electricity, which equals more than 7,000 pounds per year.

In 1980, America used 569 million tons of coal to generate electricity. By 2001 that grew to 966 million tons, which is a 70% increase.

Since 1979, the cost of coal based electricity generation has increased just 4%.

The United States has more than 250 years of proven recoverable coal reserves.

The United States population has increased 26% between 1980 and 2001. Electricity generation has increased 62% between 1980 and 2001.

Electricity from coal is less than half the cost of natural gas fired generation.

Coal is directly responsible for the existence of more than 90,000 U.S. jobs and nearly one million jobs directly and indirectly.

The burning of coal for electricity is largely blamed for air pollution. Here are some facts to consider:

- Since 1980 in America there has been an 81.2% increase in miles traveled and a 39.8% increase in the number of registered vehicles. Think about the source of smog, haze, and ground level ozone.
- Since the passing of the Clean Air Amendment (CAA) air pollution from power plants has been reduced 25% with a population growth of roughly 42.2% and GDP growth of 158%.
- The energy used by transportation, industry, commercial and residential exceeds the amount of air pollution that is produced by coal fueled power plants.

A local representative of clean coal fired generation is Duke Energy. The following are some facts on Duke Power Company:

- Duke Power is known in the industry for operating the nation's most efficient fleet of coal plants for more than 30 years.
- Duke Power will be investing a total of approximately \$2.2 billion to reduce emissions.
- Duke Power's annual nitrogen oxide emissions will be reduced by approximately 63% by 2007, sulfur dioxide emissions to be reduced by approximately 70% by 2013.
- Duke Power's SO<sub>2</sub> emission rate in 2001 was 55% below the industry average for 2001, NO<sub>x</sub> emission rate in 2001 was 55% below the industry average for 2001, and CO<sub>2</sub> emission rate in 2001 was 31% below the industry average for 2001. (Source: Energy Information Agency/Electric Power Annual 2001)

Coal base use has increased 188% since 1970 with the use of electricity from coal tripling.



**NATURAL GAS**

16% percent of electricity production in the USA comes from natural gas.

Over one-half of the homes in the U.S. use natural gas as their main heating fuel.

The only major "new" power plant construction in the last twenty years has been natural gas fueled power plants. Want to know why Natural gas costs so much and is likely to cost even more in the future? The answer is two fold:

- Due to excessive "Red Tape" in permitting, the Federal government encouraged utilities to build only Natural gas fueled power plants for the last ten years or so.
- At the same time, the Federal government and the general public have been restrictive in permitting (literally banning exploration and production in the USA) the drilling of new gas wells.

The combination of encouragement to use extreme quantities of natural gas in large power generating units, combined with a reduced domestic supply, has driven natural gas prices to new highs. So what does this mean? It means more imports by LNG but that is for another day. Leave it at this, imported LNG will be expensive. (LNG is refrigerated and liquefied natural gas.) Usually LNG is imported from overseas. Here again we are locking our nation into being dependent on overseas suppliers. Not all of those suppliers are friendly to the USA.

Natural gas for power plants has driven the price of natural gas higher for home heating and industrial uses. Coal and nuclear power should be used for electric power generation.

**Energy bill must be a priority!**

Wall Street analysts predict rising natural gas prices will continue to push our heating bills higher. Here in North Carolina we can take some comfort in knowing that our electric bills should not increase dramatically, because 95% of our electricity is generated by nuclear and domestic coal rather than gas. The fact that the U.S. Congress adjourned for the holidays without passing an energy bill is frustrating! Measures to advance clean-coal technology research. Upgrades for existing transmission lines. Tax incentives for installation of advanced pollution-control equipment on coal-fired power plants. Our U.S. senators and representatives must realize we need a national energy policy now. Economic growth requires infrastructure that includes affordable and reliable electricity. Living in North Carolina we realize the importance of nuclear and coal in our region. We recommend that all North Carolinians join Americans for Balanced Energy Choices, a nonprofit, nonpartisan organization that supports the use of coal, because coal is an essential and affordable domestic fuel source to generate reliable electricity for our nation and North Carolina. As we enjoy warm, well-lit homes and offices this winter, we must remember that access to dependable and affordable electricity is truly a gift. Electricity is what helped bring us into this century and will continue to power the technological advances of the future. If we are really serious about wanting to increase manufacturing and to attract new business to Stanly County, then we must be serious about energy on a national level. Many of the products of Stanly County are shipped to larger companies in the Midwest and North, such as automotive components, aircraft tires, aluminum, or carbon anodes. I encourage all North Carolinians to join me in asking Senators Elizabeth Dole and John Edwards to vote yes on a national energy bill early in 2004.

## STORM TECHNOLOGIES, INC.

Specialists in Combustion and Power

Serving Heavy Industry  
and Power Generation Utilities

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