

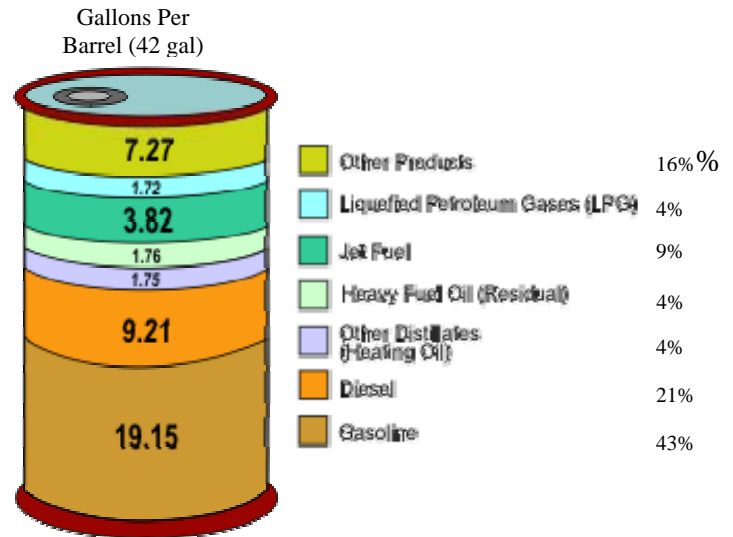
Increasing Nuclear and Renewable Energy* Sources Will NOT Relieve Our Dependence on Foreign Oil (4/15/09)

Consider How a Barrel of Oil is Used in the US

The illustration at right is found at the government website linked below – the kids page on the Energy Information Administration, EIA, website. The numbers on the barrel are the number of gallons used for the product identified by color code. That is, from each 42 gallon barrel of oil, 19.15 gallons is used to produce gasoline. We provided the percentages to the right (divide the number on the barrel by 42 and multiply by 100) so 43% of a barrel of oil is used for gasoline, 21% for diesel and 9% for jet fuel. (73% total)

<http://www.eia.doe.gov/kids/energyfacts/sources/non-renewable/oil.html#Howused>

None of the products from a barrel of oil is used to produce electricity on a large scale but politicians and the press continue to make comments indicating that renewable energy* used to produce electricity will somehow relieve our dependence on foreign oil. To fully understand the problem of obtaining energy independence, we need to examine just how energy is used in the United States.



Energy Consumption in the US

The graph below is found on the EIA website at http://www.eia.doe.gov/emeu/aer/pecss_diagram.html It is a little more complicated but shows how all sources of energy used in the US were allocated in 2007.

The easiest example to follow is Nuclear Power. Start at the nuclear balloon on the left and follow the line to the box at the right. The number 100 means 100% of nuclear power. The second number 21 is 21% of total electric power produced in the US. So 100% of the nuclear power produced supplies 21% of the electric power used. **Note: The cost of uranium imported** is minor compared to oil so building more nuclear plants, while a very good thing, will not move us toward energy independence. 8.4 is the percentage contribution of nuclear to all energy consumed in the US and 40.6% of our energy is used to produce electricity.

Coal has lines leading to Industrial, Residential and Commercial, and Electric Power blocks on the right. Less than 1% of coal supplies about 1% of all heat for homes and commercial buildings, 8% is used in industry for heat and chemicals. A whopping 91% is used to produce electricity and provides 51% of all electric power. **Note: No Coal is Imported** and is 22.8% of the total energy consumed in the US. Coal will not be easily replaced as an energy source as our green politicians propose.

If we want to reduce our dependence on foreign oil we have to look at the graph to see how oil is used, particularly in transportation.

- 70% of US oil is used to drive planes, trains, and automobiles (and ships) – 96% of all transportation is driven by oil. 24% of oil is used for industry - mostly plastic products synthetic rubber, paint etc.
- A miniscule 2% of oil is used to produce only 2% of our electricity
- Only 5% of oil is used to heat homes and commercial buildings (some propane comes from oil)

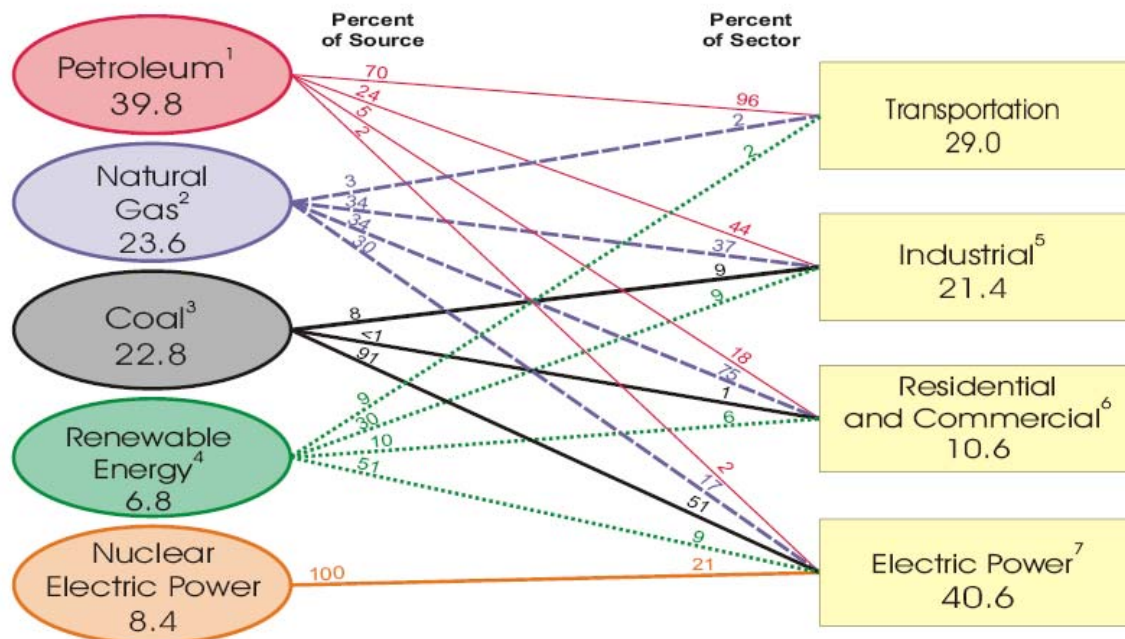
Only 2% of transportation needs are supplied by natural gas and another 2% by renewable energy* - mainly biofuels produced from corn. Using corn for this tiny percentage of the transportation energy needs nearly wrecked the world's grain supply and the ethanol fuel additive is too expensive now that oil prices have gone down. Since the price of gasoline dropped that industry is going bankrupt and new plants under construction were abandoned. 58% of US oil is imported. If we eliminate all use of oil for electric generation and home heating that number would drop to 50%. Not a big cork in the pipe considering 40% of all energy consumed in the US comes from oil. **There are only two solutions to eliminate our dependence on foreign oil: 1. cut plastic use and engine fuel consumption in half – a virtual impossibility without wrecking the economy or 2. DRILL FOR MORE OIL in the US – an activity which would also improve the economy.** Until there is a break through in our ability to store electricity for vehicles we will continue to be dependent on oil for transportation. Until there is a break through in our ability to store MASSIVE AMOUNTS of electricity; natural gas, coal and nuclear power will continue to be used for electrical generation.

Renewable Energy

Using renewable energy for electrical generation has little merit and it will not reduce our dependence on foreign oil one bit. Clean air and the obvious security benefit of multiple energy sources are the only benefits of renewable energy sources and as

noted below, air quality improvement is negligible from wind and solar. **At least nuclear power is both clean and saves us money as it is the cheapest of all methods of electric power generation despite the large initial capital cost.**

U.S. Primary Energy Consumption by Source and Sector, 2007 (Quadrillion Btu)



Solar and wind as sources of renewable energy are not viable for the generation of electricity - even for peak demand. If the sun don't shine and the wind don't blow for a few days, conventional means must be used to satisfy the electric demand on the grid. So two generation systems must be maintained to supply the same amount of electricity for peak demand and at the present time conventional power is cheaper. Capital investment is squandered and maintenance is doubled when wind and solar systems are used. Solar and wind will be taxpayer or rate payer subsidized, "politically correct" power sources for the foreseeable future even though the "fuel" is free. In fact, CPS Energy in San Antonio Texas uses more wind energy than any other utility in the state but it replaces only natural gas used for peak demand. The irony here is that gas is the cleanest burning of the fossil fuels. CPS Energy invites customers to be green and pay a premium for "Windtricity" when in fact there is very little improvement in air quality in doing so. In addition, natural gas is the more expensive of conventional fuels used for electrical generation at this time but "Windtricity", even though subsidized with tax breaks, is even more expensive than natural gas.

Consider that all the large power plants generate electricity with steam turbines. Coal, natural gas and nuclear energy are heat sources used to boil water. The steam boilers take a day or more to heat up from a cold start so must be running all the time even if there is little demand for the electricity. Daily demand varies but the difference in high demand in summer and winter and low demand in spring and fall is even greater. In spring and fall a single plant can be taken off line for refueling (nuclear) or maintenance and all power demand met by the remaining plants. However, in summer and winter all plants must be running. To reduce the need to have a full size coal, nuclear or natural gas plant operating just to meet daily peak demand in summer and winter, CPS Energy has two gas turbine generators that work much like jet engines. These turbines can be on line from a cold start in minutes instead of days. CPS is planning on adding two more of these gas turbine plants. It is these plants used to meet peak demand that Windtricity "competes" with and any wind energy capacity that exceeds the capacity of these gas turbine plants is wasted. Without these plants wind energy would not be feasible because the wind is not reliable or predictable. If a city relied on wind or solar energy for 100% of its power, they would do without power a good deal of the time.

*Renewable energy includes hydroelectric, geothermal, solar, wind, and biomass of which hydroelectric and geothermal are the most used sources.

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