

Nuclear - A Greener, Cleaner Solution

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In a world where greenhouse gases are increasing and fossil fuels are steadily decreasing, people are on the lookout for an alternative that will provide cleaner, reliable, longer-lasting energy for everyone. Two of these alternatives exist in the forms of hydraulic fracturing, or "fracking", and nuclear power. Advocates for each boast promise, but the latter is more beneficial for the economy and the environment. Though "fracking" has its merits, nuclear power is relatively cleaner, provides a greater number of well-paying jobs, and generates relatively cheap energy in an efficient way.

One of the main concerns when considering alternative energy sources like nuclear power is the overall cleanliness of the process and how positively or negatively it will affect the environment. Nuclear power differs from the standard fuel burning in that it releases significantly less CO₂ into the atmosphere than the burning of coal or fossil fuels. This is not to say that there is no CO₂ emission at all in the entire process; some fossil fuels will be burned in the process of constructing the plant, extracting the fuel, and operating the plant itself. However, comparatively, the emission of greenhouse gases when using nuclear power is still minute (Life-Cycle Emissions Analyses). As of 2014, nuclear power generates over sixty percent of "emission-free" methods of electricity generation, followed by hydroelectric power, solar power, wind power, and the like (Clean Air Benefits). Despite that, there is a waste factor that comes with nuclear power, as with all energy sources. However, the ratio of radioactive waste to energy output is very small. (What is Nuclear Waste?) In fact, if nuclear power was used nationwide in the United States and distributed equally among its citizens, the amount of waste generated per person would roughly equate to only forty grams, or the mass of approximately seven United States quarters (Touran).

Compared to fossil fuels and coal, fracking also boasts a lower CO₂ emission rate, though it is significantly larger than that of nuclear power. Fracking comprises about half of all greenhouse gas emissions in the United States, due to the release of methane during the process. (Magill, EPA Moves to Count Methane Emissions from Fracking) Methane often leaks from the natural gas production and is released into the atmosphere, joining CO₂ in the harmful greenhouse gas cocktail currently polluting the air. (Magill, 'Catastrophe' Claim Adds Fuel to Methane Debate). However, considering that the CO₂ emission rate of fracking is still relatively less, it is a more desirable alternative method than coal or fossil fuel burning. Also, in terms of waste, fracking yields oil-and-gas waste. Among this waste are toxic chemicals like benzene, which can cause cancer in humans. However, if the waste is properly managed, the risks of contaminating the environment and the health of the community can be reduced (Hasemyer).

The other major concern when choosing an alternative energy source is not the condition of the environment, but the condition of the wallet. The planning and construction of a nuclear power plant takes much assessment in terms of finances; construction requires workers and materials, and day to day operations at the functional plant require workers, equipment, fuel, and so on. However, the economic benefits that even an expensive project like a nuclear power plant

can sew are worth consideration. Every year, the average power plant generates about four hundred seventy million in economic output. About four hundred fifty million of that total output is from electricity sales of the plant alone. Additionally, studies show that for every dollar spent by the average nuclear power plant, one dollar is created in the community, and two dollars for the entire United States economy. These plants are expected to pay high taxes, which have statewide benefits; schools, roads, and other structures can utilize the sixteen million dollars that most plants pay in state and local taxes per year. The creation of a nuclear power plant also opens the door to thousands of jobs; the construction of a power plant requires up to approximately four thousand workers at peak construction time. Furthermore, suppliers of basic needs for power plants, such as concrete and electrical components, gain significant revenue from the mass consumption of their product (Nuclear Power Plants Benefit State and Local Economies).

Fracking also provides a few economical benefits. As fracking allows one to reach gas deposits that are otherwise inaccessible to people, gas is becoming more plentiful as fracking continues. Because of this, gas is becoming increasingly cheap, so consumers can use natural gas power for lower costs than ever before. Also, the price of traditionally used sources of energy, like oil, are dropping because of widespread fracking. Consumers now have more affordable access to both than ever (What is Fracking?). Aside from cost, fracking also opens a number of jobs to the community. In 2012, the fracking industry opened over two million jobs to the United States as a whole (America's Energy Economy).

Efficiency is also a key factor in seeking an alternative generation method. A nuclear power plant generates electricity around the clock at a ninety two percent capacity factor. Compared to natural gas, which figures at a capacity factor of approximately forty eight percent, and wind power at only about thirty four percent, nuclear power is extremely efficient. In addition, the fuel which a nuclear power plant uses is also efficient; one pellet of uranium fuel produces just as much energy as one ton of coal. There are about one hundred nuclear power plants in the United States, and they generate almost twenty percent of the country's electricity (Quick Facts: Nuclear Energy in America). This constant generation of electricity provides a source of reliable, cheap energy for everyone in the community.

Fracking technology has also been developed in recent years to become more efficient. In 2014, an individual fracking rig could produce over four hundred barrels of oil per day. In one site, this could potentially produce hundreds of thousands of oil barrels every day (Drilling, Fracking Efficiency Fuels Oil and Gas Boom). This large output of oil is the cause of the aforementioned plummet in gas prices in recent times. Also, a great amount of planning and simulation occurs before the fracking process begins to ensure that gas extraction and oil production will be at maximum capacity, with as little waste and risk as possible (Hydraulic Fracking Efficiency).

Finding a more environmentally friendly and efficient source of electricity is imperative in a world where fossil fuels are rapidly declining, and alternative methods such as nuclear power and fracking will open the door to cleaner and economical energy for the United States and the world at large. Which one becomes the world's leading source is for current generations to decide.

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