

Nuclear power pros and cons essay example

[Law](#), [Security](#)



Nuclear Power: Pros and Cons

US Nuclear Regulatory Commission (2011) defines nuclear energy production of energy through either splitting of atoms or combination of elements or atoms. Fusion is combination of atoms or elements with fission being splitting of atoms. Fission is the commonly used in energy production. The steam produced is used to drive turbines which produce electricity for both domestic and industrial use. The process releases neutrons which are used to repeat the process over and over. The process is referred to as chain reaction. Common examples of elements used to create nuclear energy include Uranium, and plutonium.

There are two types of nuclear reactors; Pressurized and Boiling water reactors. Pressurized water reactors (P. W. Rs) keep water under pressure to ensure that it heats and doesn't boil. Boiling water reactors (BWRs) boils the water and turns it into steam which is used in turning the generator (" US Nuclear Regulatory Commission", 2011). Radiation created during the process is well controlled to prevent harm to human beings and the environment.

Tennessee Valley Authority (T. V. A.) is a producer of nuclear energy in U. S. A. The firm is however grappling with a major challenge, which is to ensure safety of its operations and be the best globally. The staff has been trained well to prevent an occurrence of a nuclear accident. The firm has also put in place an emergency preparedness program called Prompt Notification System.

Gains and risks of using Nuclear Power over other energy sources

Gains of Nuclear Energy

Is nuclear power the answer to global warming? Is a nuclear program too hazardous and expensive to run? These questions still linger on people's minds on the relative advantages and drawbacks of using nuclear power. According to Totty (2008) nuclear power can solve the problem of global warming since it doesn't have greenhouse effects. Nuclear power sources emit zero carbon dioxide and other greenhouse gases that cause global warming. With the growing demand for electricity in the world, nuclear power is the solution to the problem because unlike other energy sources like coal, it does not emit carbon dioxide. This calls for energy sources that will cause no harm to environment.

The other advantage of using nuclear power is its reliability. Unlike hydro-electric sources, nuclear energy sources do not depend on rainfall. It can meet energy demands at any time of the day unlike solar and wind energy. Therefore, it fits well in meeting the rising demand for reliable energy sources. Nuclear energy is likely to become the last option with increasing cost of alternative sources of energy (McLeish, 2007). Fossil fuels take thousands of years to renew. Since the depletion rate is higher than renewal rate, nuclear energy is better compared with fossil fuels. In addition, solar energy is not adequate to supply energy to industries but nuclear power can serve both domestic and industrial consumers.

Drawbacks of Nuclear Energy

Totty (2008) categorizes two main drawbacks of nuclear energy; economics and safety. On economics, building a nuclear power plant requires a high investment for financing and maintaining the project. These costs make it an uneconomical source of energy. Source of financing construction of nuclear power plants are not available since the recovery of investments made usually several years. Therefore, other cheaper sources of energy like Coal make nuclear energy very expensive to run and set up (Totty, 2008).

The second drawback is safety. Many nuclear accidents have occurred for instance, Three Mile accident in 1979, and the 1986 explosion at Chernobyl in Ukraine (Totty, 2008). The effects of nuclear accidents are destructive and live long after the incident. For instance, the 1986 Chernobyl disaster instantly killed 1000 people nearby and several years after the incident radioactive effects were felt (Murray, 2009). The latest accident was in 2011 at Fukushima Nuclear Power plant in Japan that destroyed buildings and structures in acres of land in addition to killing many people. Although safety measures have been undertaken, there are inherent risks on the use of nuclear power. Lastly, the cost of producing nuclear energy is higher than any other sources. These costs include emergency mechanisms, containment, and storages of radioactive wastes (Singh, 2004). Radioactive wastes must be stored and controlled permanently till it loses radioactivity (Singh, 2004). These measures make nuclear energy an expensive source.

Factors in Building and Operating a Nuclear Plant

Before building a nuclear power plant several critical factors need to be considered OECD (2010). Projected electricity demand will determine

whether to build a new plant or not. The second factor is cost of fuel supplies. If other fuel sources are not sustainable, then nuclear energy might be a better option. Cost of funding nuclear projects must be taken into account. Nuclear projects require heavy initial capital investment therefore there must be adequate financial resources. Construction of nuclear reactors also requires heavy initial costs. Lastly, the most important consideration is impact of nuclear energy on environment. Lastly, public attitudes towards construction of nuclear energy plants should be carefully analyzed and deliberated upon. Especially with the recent accident in Japan, people would like to feel protected from such occurrences.

Decision of Where to build a nuclear plan

A nuclear plant requires ample space because of the large machinery (reactants and cooling towers), and future possibility of expansion. The space should also be relatively far away from the population and animals. This is to diffuse the risk of contamination to living things. Furthermore, a permanent water source should be around the nuclear plant site for cooling the reactor. However, the water from the plant should be thoroughly treated and stored for several months before being allowed to stream back to the water source (Murray, 2009). The area around should also be connected with tarmacked roads, which allow easy movement from and inside the plant.

Reaction if nuclear plant is to be built 125 miles from home

Research has been done to determine the safest distance that homes should be from nuclear power plants. The U. S. Nuclear Regulatory Commission warns that in a radius of 10 miles from a nuclear plant, the air could be

unsafe for breathing. Therefore with my home being 125 miles from a nuclear power plant, I am least worried of my safety. I won't worry much even on occurrence of a catastrophe. I would however take some steps to enquire about emergency measures the energy company has in place in event of a catastrophe.

Nuclear power plant between 12.5 miles to 1.25 miles

The distance is potentially unsafe for me! I will do anything to stop the construction. I would organize protests to boycott construction of new plant together with my local neighbors. If it fails, then would I rather vacate the area as soon as possible.

Experiences with nuclear energy

I have had both positive and negative experiences with nuclear energy. Nuclear energy is efficient and reliable. Unlike solar and hydro-electricity, nuclear power does not rely of external factors. I am assured to constant supply of energy at all times. There are negative experiences with nuclear energy too. An example is the recent nuclear disaster at Fukushima in Japan which affected me emotionally. I watched on television people being evacuated from the danger areas. The losses were countless. Many innocent lives were lost after the disaster occurred. Furthermore, I have come to understand that because of a nuclear accident, an entire city can be destroyed.

Things to educate the informed citizens about nuclear power

Information affects attitude and hence the behavior of a person (Murray, 2009). They will be aware of consequences of building a nuclear power

plants. Therefore, I must tell them what they don't know about nuclear energy. I would assure them about the safety of nuclear power to gain their confidence on the need to use it. I would also assure them that adequate steps have been taken to ensure their safety in event where an accident occurs. Lessons have been learnt from nuclear accidents like the one at Fukushima Nuclear Facility in Japan. Importantly, I would take much interest on educating them on how to handle themselves in case of an emergency. I would tell them that the only negative effects are depletion of uranium and heating of water near lakes or a river. I would also educate them that exposure to radiation cannot be avoided especially from sunlight, use of cosmetics and bananas but with nuclear power it is all contained!

In order to decide on whether to invest in nuclear energy or not, it is important to critically compare the cost and benefits. Fuel costs are fast increasing. Many countries have turned to nuclear energy. Therefore, on basis of costs, it is recommended. We must also consider social cost of nuclear energy. They include improper storage of radio-active wastes. It is also important to put in place adequate measures to ensure that people's lives are safe in event that a nuclear accident occurs. New constructions must comply with all safety standards.

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