



A COMPARATIVE STUDY: RENEWABLE ENERGY VERSUS NUCLEAR ENERGY

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ABSTRACT

Capability to do work is depends upon the energy. energy conservation is different from the efficient use of energy. It means we have to increase our energy efficiency by using less amount of energy resources . To protect our environment we have to control the carbon emission at least cost and least time. Energy has many forms like electrical, mechanical chemical, thermal or nuclear and can be altered from one form to other form.

KEYWORDS: Renewable energy, Nuclear power, Energy.

1. INTRODUCTION

Energy resources are generating heat or electricity. In today's culture humans consumes extra energy than ancient human beings. Appenzeller(2004). Energy resources are divided into three categories: renewable, fossils and nuclear. Appenzeller(2004) and Cohen(1983) Fossils fuels consume energy from sun but fossils' fuels are non-renewable energy. . Karnousko(2007) Solar energy is unlimited source and it is renewable and non polluting source of energy. Wind is also unlimited source of energy. It can be converted in to energy by using wind mills. Flowing water is also source of energy .by using turbine we can generate electricity. This type of energy is called hydro electric energy. all these type of energies are called renewable energy. Paish(2002) Nuclear energy is generated by the manipulation of the nucleus atom i.e., nuclear fission and fusion of heavy elements and light element respectively. Nuclear power stations use fission reaction. Cuttler(2007).

2. RENEWABLE ENERGY PROS AND CONS

Pros:

1. Fixed energy prices : energy producing capacity from any renewable energy is depends upon the investment make on infrastructure. it s never depends upon the inflated cost of natural resource available on the earth. Karnousko(2007)

2. Continuous energy source: sun produce solar energy which is renewable .like sun, strong wind and flowing water produce constant energy. Paish(2002)
3. Reliability: sun and wind is every day present so, reliability of renewable is very high.
4. Save natural resources: renewable energy resources are not using natural resources so, our natural resources is conserved for future. Tsoutsos(2005)
5. Less operation cost: overall operation cost is very low. Low operation cost can balance the infrastructure implementation cost. Sarver(2013)

Cons:

1. High development cost: infrastructure establishment cost is very high.
2. Vulnerability: renewable energy source are completely depends on sun and wind ,so if wind is slow and heavy rain effects the production of energy . Sarver(2013)
3. Low production: thermal power stations produce abundant power but renewable energy source can't produce much energy. Weather conditions are a key factor for this renewable energy which hampers the production rate. Yang(2011).
4. Big area required for stations installation: installation of large solar panels and wind farms required big area of land to produce large amount of energy. Yang(2011).



NUCLEAR POWER

Pros:

1. Low carbon emission: Nuclear power never produces greenhouse gas like methane and CO₂, like traditional fuels i.e. coal. According to The World Nuclear Association the average emission for nuclear are 29 tones of CO₂ /gigawatt/hr of energy produces. With the compare of renewable source like solar i.e 85 tone/gWH and for wind it is 26 tones/GWh and for fossil fuels i.e.; coal it is 888 tone /gwh and lignite it is 1054 tones/gwh. By this comparison we can say nuclear produces less or same emission as other renewable sources. Ghiassi(2002).
2. Not irregular: Renewable energy similar to wind and solar is active only when wind is blowing and or sun is shining. Nuclear power stations can run without these type of interruptions and produce energy. Hannum(2005)
3. Low-cost to run: nuclear power station management cost like managing radioactive fuel and disposal of nuclear waste is between 33% to 50% of a coal station and 20% to 25% of gaseous stations. The energy produced in these nuclear stations are of superior quality. Vojdani(2008).

Cons:

1. If it goes wrong....: Three major nuclear meltdowns in recent year are a) three miles island in 1979 b) Chernobyl in 1986 and c) Fukushima 2011. After taking all safety actions in these nuclear stations due to different causes these power stations melt down. In Chernobyl instant passing away of 54 citizens and by the International Atomic Energy Agency (IAEA) predicted a number of 4000 casualty in long term due to radiation leak. Billions of money is used up to fix these nuclear stations. Kautsk(2013) and Ten Hoeve(2012).
2. Nuclear waste: nuclear power produces nuclear waste. World produces 3400m³ nuclear waste each year, which takes many years to degrade. Kautsk(2013)
3. Infrastructure cost is very high: the initial cost to set up infrastructure is very high. It is approximately \$34-84 billion for setup and \$4-6 billion extra cost to maintain the facility.

CONCLUSION

Presently society is completely depend upon fossil fuels like 39% natural gas, 24% coal, 23% coal, 8% nuclear and 6% others. These are not renewable in nature. Resources of these non-renewable energy are limited. Nuclear power comes into non-renewable sources because uranium

and similar heavy metal sources are limited. Some people think nuclear energy is renewable only due to thorium and some new technologies may provide infinite resources of energy.

Future scope

Some experts say breeder reactors always could produce fissile materials. Breeder reactor use neutrons which produced after fission to create nuclear plutonium. Thorium is a radioactive metal which found in vegetation, water and soil. And it's safer than uranium and enormous storage to dispersion.

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