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NUCLEAR POWER IN CHANGING WORLD

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ABSTRACT

Nuclear power is the electricity generated by the nuclear power plants that provide the heat from nuclear fission in a nuclear reactor [1]. In the developing world, every nation established a nuclear power plant to produce nuclear energy. Every year the production of energy is increasing and energy production using nuclear power plants also increases. In the 1980s, the annual electricity generation from nuclear power plants was less than 10,000 TWh but in 2010, it went up to 20,000 TWh annually. A report on "Global Total Primary Energy Supply (TPES) by Fuel, 2017" says that the share of electricity production from nuclear power plants is 4.9% of the entire energy produced by all the methods [4]. Nuclear energy was introduced to the world as a cleaner way to produce energy and avoid fossil fuel but with the development, destruction is the cause. With the help of nuclear energy, the world developed nuclear weapons. Nuclear weapons like atomic bombs and hydrogen bombs are only useful for destruction and not for the world's development. The production of electricity from nuclear energy has increased exponentially and it replaces fossil fuels usage. It is a cleaner fuel as compared to fossil fuels.

Keywords: Nuclear Power, Developing, Atomic Bomb, Cleaner Fuel.

I. INTRODUCTION

The electricity which is produced by the nuclear power plants is known as nuclear power. Electricity in nuclear power plants is produced by two methods, nuclear fission and nuclear fusion but at present time, nuclear fission is in major use for the production of electricity in nuclear power plants. Every country's main focus is to produce electricity by nuclear fusion.

Nuclear power is in the top 5 sources for the production of world's total electricity with almost 15% of total electricity production. In the 1960's, first prototypes of nuclear power plants were established. These power plants provided the knowledge and data of using nuclear energy for the production of electricity. These power plants were the foundation for the future development in the nuclear power plants which are currently in use.

Nuclear power stands in one of the safest and cleanest sources of energy compared to other sources such as petroleum. Coal. Nuclear power has caused less fatalities per unit energy but other sources of energy such as Coal, petroleum have caused more deaths due to air pollution and other accidents.

Nuclear power is much more efficient in producing electricity. Nuclear power is a cleaner fuel and it prevented the emission of carbon dioxide.

II. METHODOLOGY

Analysis of world energy

With the comparison of the world's total energy production to the world's nuclear energy production, the world has moved to nuclear energy much more than any other source of energy.

Share of nuclear power

In 1985, the trend of using nuclear power as a source for producing electricity started and it increased every year in many countries while other countries were not efficient to build power plants but in recent years most of the countries are making power plants and the share of nuclear power in the production of electricity increased gradually from 1985 to 2020. The share of nuclear energy increased from 0% to 4.9% of the total energy production in the world.

Shifting to cleaner fuel

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With the development of the world, every country has realized the importance of cleaner fuel as there is a gradual decrease in the share percentage of fossil fuels in energy production while the use of nuclear power increased. Nuclear power is a much cleaner source to produce electricity.

III. MODELING AND ANALYSIS

With the help of the data of the production of electricity from the nuclear power plant since 1985, we can see the changes of the techniques and dependency on all the sources of energy. From the data, we can make the graph showing the change in the percentage of usage of nuclear energy in producing electricity. On comparing the share of electricity production from nuclear power plants to all other sources, we can see the increase of nuclear energy usage.

The research on the production of electricity from nuclear plants depends on the data of the world's total energy production and share of nuclear energy. On the basis of data, we can analyze the development in the field of production of electricity from nuclear energy.

Form the graph below, it can be seen that the amount of production of electricity from nuclear plants compared to total electricity production, there is a gradual increase. This increase indicates that the world is moving ahead toward the use of nuclear power plants.

In the observations of 26 countries electricity production data, these countries have more than 450 nuclear power plants which are in use for the production of almost 15% of the world's total electricity demand [5]. In some countries, nuclear power has become the most important source of electricity. But the progress of nuclear power from an idea to a commercial reality has not been an easy one [6]. It has been full of events, with many successes and also some failures [7].

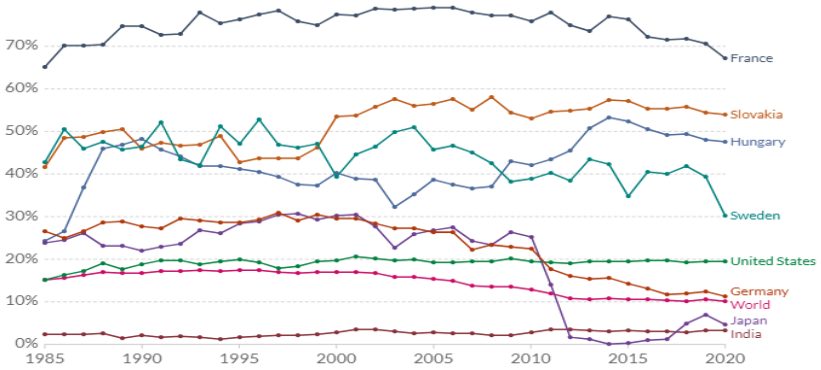

Figure 1: Percentage of electricity production from nuclear power

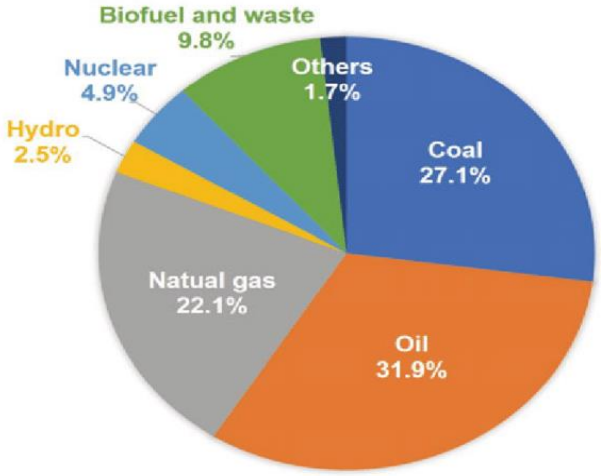

Figure 2: Global Total Primary Energy Supply (TPES) by Fuel, 2017

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IV. RESULTS AND DISCUSSION

Nuclear energy was introduced to the world as a weapon but with the change of time, nuclear power plants developed across all over the world which is used to provide electricity. Every county is adopting nuclear energy as an alternative to petroleum and other fossil fuels for producing electricity.

The demand and supply of nuclear power have grown all over the world and every nation supports other countries to develop a power plant. There is a risk associated with nuclear energy is nuclear pollution and nuclear waste which slows down the adaptation of nuclear energy.

Most of the developed nations produce a large amount of electricity from nuclear power plants and developing countries like India, also heading toward the production of electricity through nuclear power plants. India's top five sources of electricity are coal, gas, hydroelectricity, wind power, and nuclear power. In India, nuclear power made a large impact in a very small period of time.

Table 1. Top 5 Nuclear Generating Countries, 2016

Country	Total Generation (bKwh)	Nuclear Electricity Generation (bKwh)	Share of country's total generation
United States	4,095	805	19.67%
France	529	386	73.04%
Slovakia	25	13	54.25%
Belgium	79	41	51.90%
Hungary	30	15	50.23%

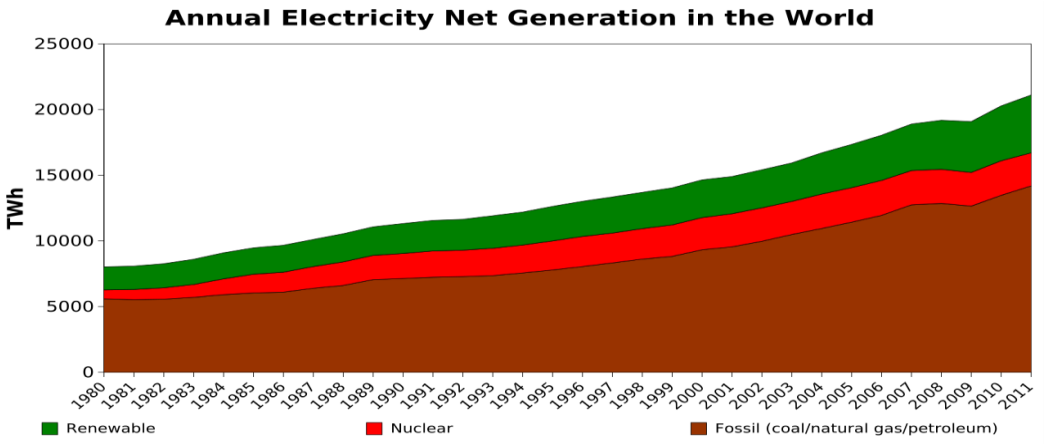

Figure 3: Annual Electricity Generation in World

V. CONCLUSION

Developed countries like the USA are the leading producer of nuclear energy. The world as a whole developed nuclear energy and adapted this technology to produce electricity. Every country wants to decrease its dependence on fossil fuels and nuclear energy is the best alternative to fulfill the demands of energy.

Developing nations like India are also working on nuclear energy and developed many power plants all over India. Nuclear energy is much safer than fossil fuels as it caused much fewer deaths in a year than fossil fuels.

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