

# RENEWABLE ENERGY SOURCE FROM LIGHTNING STROKES

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**Abstract** - Power crisis is the major issue of the world. There have been lots of many invention and conceives but those innovation has been endanger, because of simple fact of non availability of energy resources. The nature offers us one such option is the power of lightning it is known that lightning can produce huge amount of power. This paper describes about the method for harvesting the new source of renewable energy from lightning strokes.

**Index term-** electricity lightning, power crisis, renewable energy

## 1. INTRODUCTION

Now a day the world facing the power crisis and consequently a renewable energy requires as energy contributes to solve the crisis. It is very important to find out the renewable energy sources for domestic as well as small commercial purpose. In 1980's, there have been several attempt to examine the possibility of collecting energy from lightning. A single bolt of electricity (approximately 5 billion joules or about energy tic as well as small commercial purpose. In world, more than 60% of people and in India nearly 70% of people are not getting electricity for daily use [2]. For providing power to consumer all conventional as well as non conventional resources are used. it is believe that lightning strokes is a good future to be free and natural source of energy clouds and hence clouds may possesses either positive or a negative charge, depending upon charge they contain. The charge on a cloud may be release to another cloud and we call it discharge of lightning. There are three primary types, from intra cloud, from one cloud to another cloud and finally between cloud and earth. Out of three, CG lightning is the most originate in a cumulonimbus cloud and terminates on the ground. Even though IC and CC are more common. The lightning occurs approximately 40-50 times a second resulting in nearly 1.4 billion flashes per year. stored in 145 liters of petrol) [4]. It has been proposed that the lightning we use to generate hydrogen from water by electrolysis process, or to harness the energy from water by rapid heating, to tap the lightning by lightning arrester and it stores into capacitors or batteries [1]. It is known that to obtain the real lightning strokes energy is very difficult task as well as very dangerous. According to previous studies, tesla coil is a high voltage coil that produces ionic emission in the form of electrical discharges in many times. Usually it is used to generate high voltage by using mock

lightning which is produced by mock generator and that can harvest lightning energy [1].

## 2. LIGHTNING HARNESSING PLANT

### A) Lightning

Lightning is an electrical discharge between electrically charge region within cloud or between cloud and earth or between clouds. When the clouds are charge to the high potential with respect to ground or neighboring clouds a huge spark takes place between it. When there is friction between up-rush hot moist air and a tiny particle of water causes the building of charge. When water drops are formed and accumulated, they form a typical thunderstorm has three or more strikes to the earth. Lightning primarily occurs when warm air and cold air are mixed together resulting in atmospheric disturbances. It can also occur during forest fire, tornadoes, and volcanic explosion.

### B) Lightning Rod

The principle of lightning rod was first developed by Benjamin Franklin in 1749 and further improvements towards a reliable system around 1760. A Lightning rods metal rod or metallic rod which is made by copper or aluminum. And it is mounted on the roof of building, a ship or even a tree. The diameter of rod is 2 cm. It connects to a piece of copper wire and the wire is buried in the ground or earth. The purpose of lightning rod is to tap lightning strikes and provide low resistive path to the ground.

### C) Methodology

Harnessing the lightning energy is somewhat difficult to tapped for the later use. As it is in tremendous amount but it is not impossible. We can't store the large amount of electricity tapped from lightning for later use Electricity can be stored by the new technologies such as utility scale battery technology or other energy storage technology such as capacitor or flywheel. We can use this energy for grid. In frequent thunderstorm region, such as Florida, lightning capturing power plant would become practical. As a lightning occurs, it is tapped by lightning rod and this lightning rod is used as a source of energy about 1 mw of electrical discharges can be tapped with the help of lightning rod after that it is fed to the isolator circuit further it is step

down by number of tesla coil step down transformers upto 10 volts, 10 mega amps for 20 ms and this power is directed under the ocean. In ocean electrolysis of water is done in order to produce large amount of hydrogen and oxygen gas. Then numbers of turbines are connected to the generator which produces more amount of continuous power and this power is transferred to the large storage devices.

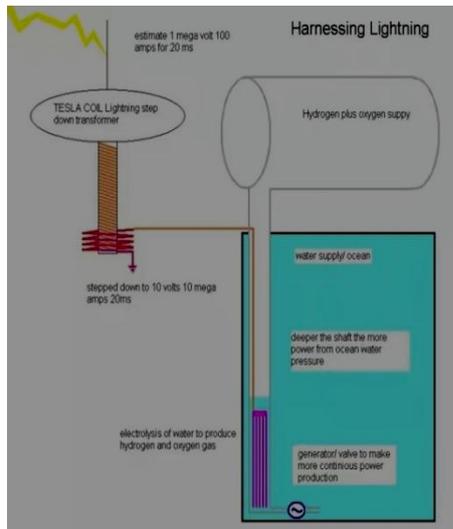


Fig. 1: Lightning Harvesting Plant

### 3. ELECTRICITY TAPPED BY LIGHTNING ARRESTER

Lightning sources possesses much more amount of electricity than any other. This process of using renewable lightning energy source for the human use would be proved advantageous.

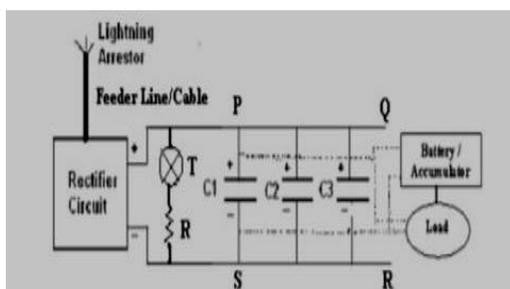


Fig. 2: Electricity tapped by lightning arrester

Generally in stor my whether natural disaster such as lightning is often happening problem. As the very high voltage produced by the lightning is wasted in the ground. We have to use this energy as electricity for our day to day life. For this, we fit large number of lightning or catchers at the roof of multistoried building, trees and towers etc. every lightning arresters is connected to a common transducer placed at the particular location by the copper wire having sufficient thickness. When the lightning occurs very high

amount of electricity is catch by the lightning arrester and it is flowing through the conducting feeder or cable and the circuit. Then this DC voltage is fed to the capacitors namely C1, C2, C3. This capacitors are having with high capacitance range which are used in HT lines. Hence this charged capacitors or the batteries act as a DC voltage source and they are fed to the load.

### 4. POWER OF LIGHTNING

At any given moment, there are about 1,200 thunderstorms occurring all over the Earth, and it's estimated that each second, there are about 100 lightning flashes somewhere over our planet. A typical lightning bolt contains about 15 million volts of electricity and instantly heats up the air around it to over 60,000 degrees, with some reaching more than 100,000 degrees. That's why the total energy of a strong thunderstorm can exceed the energy released during an atomic explosion.

### 5. HARVESTING LIGHTNING ENERGY

A technology capable of harvesting lightning energy would need to be able to rapidly capture the high power involved in a lightning bolt. Several schemes have been proposed, but the ever-changing energy involved in each lightning bolt render lightning power harvesting from ground based rods impractical – too high, it will damage the storage, too low and it may not work. Additionally, lightning is sporadic, and therefore energy would have to be collected and stored; it is difficult to convert high-voltage electrical power to the lower-voltage power that can be stored.

### 6. CONCLUSION

The present work has been directed a better understanding of harvesting the lightning energy in a small scale system. In order to achieve the above work was focused on the development of a small scale laboratory experiment. It was done by injecting capacitor, which represent an energy storage device. Lightning rods have proved themselves to be the source in command in realizing the solution for this issue.

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