

## Renewable Energy Sources

Sourabh Dubey <sup>+</sup>

**Abstract:** In today's world the "energy" is one of the most talking topics. The scientists of almost all countries are working on to reduce the energy consumption or to use energy in an efficient way: basically, trying to increase the usage of renewable resources of energy rather than the usage of non-renewable resources of energy. The objective of the paper is to come up with some innovative ideas to optimize the renewable resources of energy in an efficient way so that to contribute in the reduction of energy crisis.

### 1. Introduction:

This paper mainly focuses on the new ideas or sources of energy that we only think upon to utilize it. To implement any renewable resources of energy, we have to first know deeply about it. Energy as we know can be transformed from one form to another, and this can be done by the certain assembling circuit of transducers. This paper mainly constitutes the utilization of energy like "voice", "lightning" in rainy days, "energy released during the collision of meteorites in space", "transformation of energy" and some new ideas to reduce global warming which is also a burning topic these days.

### 2. Utilization of "VOICE" as a form of energy:

Since we know voice travels in the form of wave, and it is a transverse wave that's why it cannot travel in vacuum, let us understand it with live example, whenever you listen to an amplifier which is lauding to some distance, you would have felt that sound from the amplifier sometimes coming with very high amplitude and sometimes it becomes silent, sometimes the amplitude of the sound becomes very low, the reason behind this phenomenon is whenever there is vacuum created in the atmosphere between your ear and amplifier the sound cannot travel and whenever the vacuum is being filled by the air the sound starts coming again. This vacuum in the atmosphere is created due to the heated air becoming light and moving upward leaving the vacuum there.

Now we know voice is a wave, actually it travels in the form of compression wave, so obviously it consists of amplitude and frequency. And if anything consists of amplitude and frequency will have "resonance".

Resonance occurs when a system is able to store and easily transfer energy between two or more different storage models such as kinetic energy and potential energy. Resonance is actually the tendency of a system (usually a linear system) to oscillate with larger amplitude at some frequencies than at others. These are known as the system's resonant frequencies. At these frequencies, even small periodic driving forces can produce large amplitude oscillations.

Resonances occur when a system is able to store and easily transfer energy between two or more different storage modes (such as kinetic energy and potential energy in the case of a pendulum). However there are some losses from cycle to cycle called "damping". When damping is small, the resonant frequency is approximately equal to the natural frequency of the system. It was first recognized by "Galileo Galilei", with his investigations of pendulums and musical strings beginning in 1602. There are various types of

---

<sup>+</sup> Corresponding author. Tel.: + 8652174778  
E-mail address: sourabhsonu1989@gmail.com.

resonance occur like as: mechanical resonance, acoustic resonance, electromagnetic resonance, nuclear magnetic resonance, electron spin resonance, and resonance of quantum wave functions. Actually, resonance occurs widely in nature, and it exploited in many man made devices. It is the mechanism by which virtually all sinusoidal waves and vibrations are generated. Light and other short wavelength electromagnetic radiation is produced by resonance on an atomic scale, such as electrons in atoms. The resonances like nuclear magnetic resonance (nmr) is like a physical phenomenon in which the magnetic field absorb and re-emit the electromagnetic radiation. The energy which is at a particular resonance frequency depends upon the strength of the magnetic field and the magnetic properties of the atoms. In practical applications the frequency is approximately equal to very high frequency and ultra-high frequency television broadcasts (600-1000MHz). Nuclear magnetic resonance allows the observation of specific “quantum mechanical” magnetic properties of atomic nucleus. Now, quantum mechanics deals with the physical phenomena at microscopic scales. Quantum mechanics provide a mathematical description of much of the dual particle-like and wave-like behavior and interactions of “energy and matter” and since the “nmr” is a constituent of “voice” so we can say that it has also an energy matter interaction property. As far we have proved that voice is a form of energy, now we will see how to utilize this form of energy. The answer is by the help of “piezoelectric crystal”. Crystal microphones utilize the piezoelectric properties of crystals to convert sound waves into electrical pulses. The first demonstration of piezoelectric effect was done in 1880 by the brothers “Pierre curie and Jacques curie”. They demonstrated the effect using crystals like – cane sugar, topaz, quartz, tourmaline and sodium potassium tartrate tetrahydrate (Rochelle salt), of which quartz and Rochelle salt exhibited more piezoelectricity. What Curie brothers found actually was, there was some accumulation of charge in certain solid materials that are mentioned above, by applying some mechanical stress on them. The word piezoelectricity means electricity resulting from pressure. It is actually a reversible process in which the electrical charge generates from an applied mechanical force and mechanical strain generates by applying electric field to the crystal. For example, lead zirconatetitanate crystals will generate measurable piezoelectricity when their static structure is deformed by 0.1% of the original dimension and conversely, the same crystal will change about 0.1% of their static dimension when an external electric field is applied to the crystal. Crystal microphone uses the piezoelectric effect by placing the sensitive diaphragm over a piezoelectric crystal. Vibration of the diaphragm due to sound waves pushes against the crystal, deforming its original shape, causing it to generate an electric current of variable voltage. The signal may then be amplified and can be used in offices where many people work and thus we can save the large amount of electricity power. Hence we can utilize the sound as a form of energy where it is generated in higher or lesser amount. Given a threshold sound power ( $W_0$ ) of  $10^{-12}$  W and observed sound power (W), Eqn. (1) can be used to calculate the sound power level,  $L_w$ , in decibels (dB) from a source:

$$L_w = 10 \log (w/w_0) \quad (1)$$

The above concept of utilizing voice energy can be done in industries to reduce the non-renewable power consumption.

### 3. Utilization of “LIGHTNING” as a form of energy:

Lightning have two ends, top end considered to be +vely charged and the bottom end considered to be –vely charged, and the earth as we know acts as a +ve plate of parallel plate capacitor which is at zero potential. Now, when the electric potential between the two clouds or within a cloud and the earth reaches a sufficiently high value (about 10000/cm or 25000v/inch) the air becomes ionized along a narrow path and lightning flash results.

#### 3.1. How to arrest this lightning energy and optimize in the industries?

The answer is through “arrestor”. It works on the principle of “insulation withstand voltage”. Arrestor is the component which provides a way for lightning to go to ground which is at zero potential, as we know everything tends to go from high potential to low potential, because every things try to be in stationary state by losing its excited state. The conductor has a potential edged one side and the other side is connected to a

long thick copper strip. When lightning strikes it, the current flows through the copper strip. This strip forms a low resistance path for the lightning discharge. Now, when ground side of the arrestor connected with the “series compensation idea” that will do the even distribution of that huge amount of energy into fractional small amount, so that we are able to store these, because series compensation is the series structure consisting of diode and resistors. It can withstand a voltage from 800kv to 1010kv/ circuit. In this fig.  $C_s$  is total capacitance of impulse volt.,  $U_{ch}$  is Total charging voltage,  $R_s$  is Total front register,  $R_p$  is Total tail register,  $L_s$  is Total loop inductance,  $U_t$  is Applied test voltage.

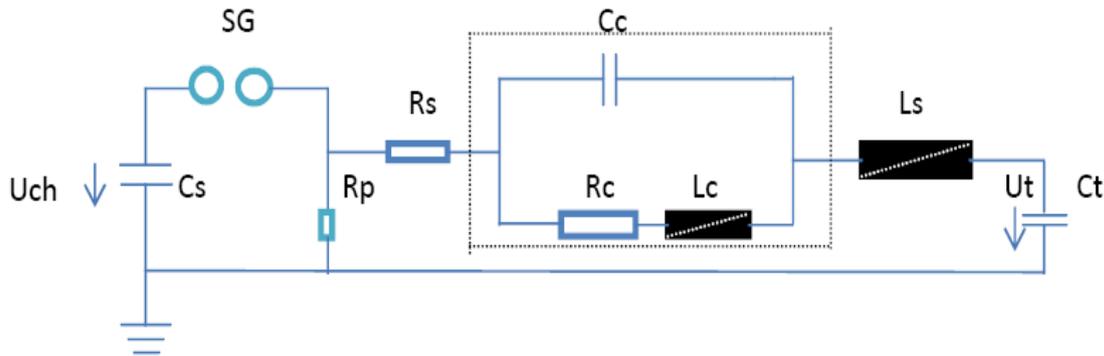


Fig.1: Equivalent impulse circuit diagram with series compensation

#### 4. Utilization of energy released through the collision of “METEORITES” in space:

The huge energy released when various meteorites collide in the space, if we somehow able or manage to utilize this huge amount of energy, the problem of energy degradation will be solve out for another 200-500 years.

Considering estimation it is assumed that the collision between earth and any asteroid (a few kilometers in diameter) may release as much energy as several million nuclear weapons detonating simultaneously. Calculations show that a meteorite with a diameter of 30meter, weighing about 300000 tones, travelling at a velocity of 15 km/sec., would release energy equivalent to about 20 million tons of TNT after collision. And as we know that only 1 gram of TNT can produce energy equivalent to 4284 joule of energy. We can imagine how much energy a ton of TNT produces, about 20 million tons of energy.

This type of collision has happened once 49000 years ago in Arizona leaving a crater 1200 meter in diameter and 200meter deep.

since we know that earth is a zero potential body , means a low potential body , and energy released due to collision of meteorites in space as we know is at very high potential, but what happens actually is, as soon as the energy released it gets distributed to all low potential bodies in the universe, what we need to do is to create a low potential path to the earth, this path should be most appropriate of all the low potential paths in the universe, so that all the energy or some part of it released, can be grasped to the earth itself.

Now the problem is to create that most appropriate low potential path, it's not though an easy task but is possible, it can be done by the ionized air, means the air consist of free ions to conduct the energy, and this can be done with the help of “INTERSTELLAR MEDIUM” in the space. In astronomy, the “INTERSTELLAR MEDIUM” (or ISM) is the matter that exists in the space between the star systems in a galaxy. This matter includes gas in ionic, atomic, and molecular form, dust, and cosmic rays. It fills interstellar space and blends smoothly into the surrounding intergalactic space. The energy that occupies the same volume, in the form of electromagnetic radiation, is the “INTERSTELLAR RADIATION FIELD”. The first mechanism proposed for heating the ISM was heating by low-energy cosmic rays. Cosmic rays are an efficient heating source able to penetrate in the depths of molecular clouds. Cosmic rays transfer energy to gas through both ionization and excitation and to free electrons through Coulomb interactions. Low-energy cosmic rays (a few MeV) are more important because they are far more numerous than high-energy cosmic rays. And as we know when an electron is freed from an atom (typically from absorption of a

UV photon) it carries kinetic energy away of the order: “E<sub>photon</sub>- E<sub>ionization</sub>”. This heating mechanism dominates in HII regions; the H II region is basically the region with low density cloud with partially ionized gas in which the formation of star takes place. These regions constitute blue stars with the huge amount of ultra violet light which ionizes the surrounding gas. Which are the most important ingredient for energy transferring. Hence this way the energy from the meteorites can be transferred to the earth and for vacuum space as we know according to quantum mechanics, the vacuum state is not truly empty but instead contains fleeting electromagnetic waves and particles to transfer energy that pop into and out of existence which is formulated by Feynman, Tomonaga and Schwinger. Hence we can bring out the huge amount of energy to the earth not wholly but some part of it.

## 5. Utilization of the wasted electricity in the form of heat:

According a researcher name Dr. Zhong Lin Wang, Ph.D., “More than 50% of the energy generated in the U.S. each year goes to waste, much of it as heat released by everything from computers to cars to long-distance electric transmission lines.” And this is the problem in almost all the countries. So, why not to utilize these wasted heat again in the form of electricity by the use of “**pyro electric crystals**”. Pyroelectricity (from the Greek *pyr*, fire, and electricity) is the ability of certain materials to generate a temporary voltage when they are heated or cooled. The change in temperature modifies the positions of the atoms slightly within the crystal structure, such that the polarization of the material changes, the change in polarization give rise to a voltage across the crystal. If there is not any difference in the temperature the voltage due to pyroelectricity becomes zero due to leakage current (the leakage of current is due to the electrons moving through the crystal, ions moving through the air, current leaking through a voltmeter attached across the crystal etc.). Actually pyroelectricity is completely different from thermoelectricity, the whole crystal is changed from one temperature to other and also the voltage generated is temporary in the case of pyroelectricity but in the case of thermoelectricity one side of the material is kept on one temperature and other side of the material is kept on different temperature and also the voltage generated is permanent in this case. While using my computer if I place a pyroelectric sensor on the heated zone of my computer with respect to the normal temperature or even with respect to the air conditioned room temperature the temperature difference between the heated zone of computer i.e. CPU in the case of desktop computer, and the air conditioned room environment will change or modifies the position of the atoms and that will create a temporary voltage through the crystal and that voltage can be amplify and can be utilized as the source of electricity to the corresponding computer. Means, the idea is to create cyclelike heat generated by computer produces electricity due to the pyroelectric crystal then again the electricity is being utilized by computer to run and this cycle can be continued.

Even this concept can be utilized in the vehicles. The body light of a car and other electric equipments can be run by the help of pyroelectricity concept no need to burn battery chemicals and fuels. Because there is also an engine heated area and air conditioned cooled area in a car, so there is a temperature difference which is the main requirement for working of the pyroelectric crystal. The loss in the form of heat is common in transmission lines and since the signals are being transmitted in the form of electric signals, the concept of pyroelectricity can be used here also, the pyroelectric sensor will work due to the temperature difference of the transmission line with respect to the normal temperature inside or outside earth surface, and this will enhance the signal which became weak due to the loss in the form of heat, hence results in the better signal at recipient side. This concept can be utilized in various other ways in various industries to save the non-renewable energy resources. **NOW-A -DAYS GLOBAL WARMING IS ONE OF THE BIGGEST PROBLEM OF THE WORLD, I HAVE SOME IDEAS**

## 6. Use of “HUMAN HAIR” to reduce global warming:

Since, human hair is one of the most easily available product. But it is a very unique thing having unique properties. Actually the primary component of hair is “keratin”. Keratins are the proteins, long chain (polymers) of amino acids. These are the proteins which accounts for 30% of cellular protein of living epidermal cells and 85% of cellular protein of the dead cells in the outer skin of our head, which are the forms of amino acids, having the same properties as amino acids. Amino acids are of various types, but by

the experiments it is found that “phenylalanine, tyrosine and tryptophan” are the type of amino acids which absorb carbon content mostly. Now, the question arises that why only these three types of amino acids are responsible for the carbon absorption mostly? We can answer it as actually we can conclude it by considering the experiments by some chemists in 2011, that all these three types of amino acids have mixed functioning of their oxides which share biochemical and immunological enzymatic activity in common. And these all have common ancestor, so all are hydroxylases group that means all have an affinity with the carbon molecules, specially hydrated carbon molecules.

It was proved by the experiment done on a plant seed called “sandstone grassland community” in 2011, where it was found that the absorption of carbon content by that seed was more than the other seeds, from the environment when the corresponding seed, when dipped in the soil, is being fed limestone, calcareous sandstones and volcanic andesite and these constituents tend to absorb carbon, and the same content or tendency is found in our hair also. So, it can also absorb more carbon content from the environment, to let it free from excessive carbon content, which is the major reason for “global warming”, and also the hairs are black in color so obviously it absorbs more heat means more infrared radiations to clean up the environment. So, we should use human hairs at the outer level of our building architectures to absorb carbon content from environment. Now the question arises why to apply hairs on architectures? Answer is the absorbed carbon from the environment by the hairs can be a beneficial catalyst for the iron and the steel pillars used in the architecture. Absorbed carbon will absorb the moisture, that causes rusting to the pillars and also due to the absorbed heat through the hair will dried the moisture so, increased life of pillars. Actually the carbon absorbed by the hairs in the architecture has a great affinity towards the moisture containing colloidal impurities, because of the presence of ionized electron in their hybridization structure so that it absorbs the moisture. Again the question arises that why the cutting hair is been useful? It is used here because the dead cells of our body even it is nail or hair, due to the presence of protein chains in them, become a sensitive attractor to the heavier molecules like carbon and sulphur, when get detached from our scalp that is from our living cells on the head, eventually it is insensitive when in contact with the living cells. So they always tend to attract the heavier molecules like carbon from the environment when got detached from the living cells.

## 7. References

- [1] Power of Human Voice by Ashley Seni
- [2] Mystries of Lightning by Alexander V. Gurevich and kirill P.Zybin
- [3] [www.bigscience.com/big-in-science-articles/pyroelectric-nanogenerators.html](http://www.bigscience.com/big-in-science-articles/pyroelectric-nanogenerators.html)
- [4] [en.wikipedia.org/wiki/Vacuum\\_state](http://en.wikipedia.org/wiki/Vacuum_state)
- [5] [en.wikipedia.org/wiki/Interstellar\\_medium](http://en.wikipedia.org/wiki/Interstellar_medium)
- [6] McKee, C. F.; Ostriker, J. P. (1977), "A theory of the interstellar medium - Three components regulated by supernova explosions in an inhomogeneous substrate", *Astrophysical Journal* **218**: 148, Bibcode 1977ApJ...218..148M, doi:10.1086/155667