

Production of Electricity from the Artificial Nano Trees

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Abstract—Harvesting energy from the atmosphere responsibly is vital, natural trees and plants try this expeditiously already for scores of years. Our invention is that the mimicking of this ingenious idea conjointly noted as bio mimicry or bio mimetic, particularly this invention relates to the form and kind of leaves and needles and their incorporated nonmaterial's that permits the Nano leaf to reap, capture environmental energies like radiation, wind and sound and switch this into electricity, the Nano leaves made of a versatile substrate, is exploited on either side, employing a method referred to as thin- film deposition which is able to incorporated thermo and electrical phenomenon material for the aim of changing radiation (light and heat) additionally we have a tendency to introduce electricity connective components that connect/affix the leaf to the plant or tree, this not solely permits fast and secure assembly however it conjointly serves for turning wind energy into electricity. what is more we have a tendency to will get our Nano leaves as near real as attainable, a method to realize this can be to impress the leaves, making a three-dimensional leaf surface image, that is useful for gathering and capturing radiation. The invention advances upon all previous art artificial leaves, needles and grasses as well as water primarily based plants, this technique not solely foresees associate economical and economical thanks to harvest radiation and wind energy via incorporation of thermo-electrical phenomenon and electricity materials however conjointly reveals a way for affixing artificial leaves which will harvest and capture star radiation, wind energy and energy generated from falling rain and hail, providing an aesthetically pleasing and natural looking artificial leaves and needles that can be affixed to trees, plants, shrubs and water based plants. Furthermore the main advantage of these Nano leaves is that these leaves are converting more energy than the solar panels. When we comprised the energy produced from Nano leaf tree to the energy produced with the solar panels, we found out that artificial Nano trees are converting solar radiation (light and heat) and wind(3 in 1) 130kwh p/in² per year 370 euro p/in and solar panels are converting sun light 90Kwh p/in² 580p/in².As far as we concern about the usage of this energy, this electrical energy can be used for driving the car which will reduce the use of the fossil fuels and can be used to enlighten the house.

It concludes by stating that the scope of the renewable energy from the Nano leaf tree in a relatively modern field will tend to solve the very big problems for the world like global warming.

Index Terms—Nano leaves thermo voltaic, photovoltaic and piezoelectric.

I. INTRODUCTION

Today a lot of discussion has been happening in scientific circles regarding however real is that the development of

worldwide warming and what would be mankind's response in averting the consequence of it. Realizing this, steps are taken to scale back the utilization of fossil-based energy and work an equivalent with renewable sources like star and wind energy etc. until currently we have a tendency to square measure manufacturing the electrical energy with the means that of either wind mills (only the impact of wind) or star panels (only the impact of star energy) up to now however all the 2 varieties of these energies we have a tendency to don't seem to be victimisation in same system. If we'll do thus then for sure we are able to get the a lot of economical system than ever we have a tendency to had. thus here during this paper can|we'll|we are going to} demonstrate however a synthetic tree will manufacture the current by victimisation each (wind also as solar) energies .For constructing the factitious tree the primary step is to construct the nano leaves .The nano leaf can comprises 2 clear conducting layers one at the highest and different one at the bottom .Between these 2 layers we have a tendency to square measure inserting skinny film pic voltaic layer to convert the daylight into current and skinny film thermo voltaic layer to convert the thermal radiation into electricity [1].The nano leaves then connected to twigs and branches victimisation small electricity components that convert the movements of the leaves caused by wind and rain into a lot of electricity. it'll be fascinating to grasp that one tree betting on the scale and placement, will manufacture between 2000 and 12000 kc annually [2] and the trees give shade and performance as a hedge.

II. WHY NANO LEAVES

We know that electricity crystals, photograph cell and thermo voltaic cells square measure wont to convert the one variety of energy into electricity however until currently we tend to aren't exploitation these all the techniques within the single system. assume if we tend to square measure mingling these all the techniques in single system then sure differing types of energies returning to the system are often regenerate into immense quantity of electricity. thus for this, the sole and also the best resolution is that the Nano leaves as a result of the leaves on a tree get of these sorts of energies like alternative energy from sun, wind energy as stress from the rain and for changing these all the energies into electricity all the higher than mentioned techniques we square measure having during a single nano leaf. the opposite main motive to decide on nano leaves is that the dimensions is little and compact. The other main advantage of exploitation Nano

leaves is that it will turn out a lot of electricity than the solar panels.

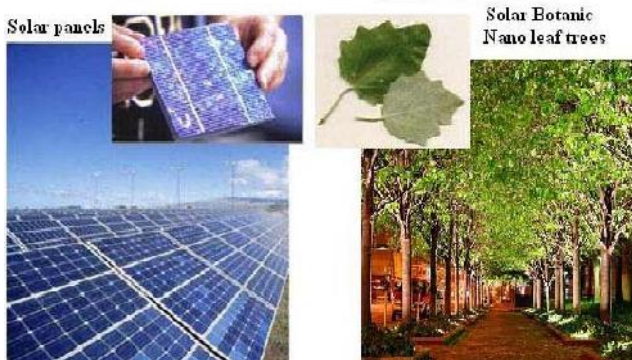


Fig. 1 View of solar panels and nano leaves trees

Table 1. Comparison b/w solar cells & nano trees in production field.

S.No.	Solar Cells	Nano leaves
1.	90kwh/in ²	130kwh/in ²
2.	It can produce power from solar energy only	It can produce power from solar, wind and from rain also

III. OVERVIEW OF NANO LEAVES TECHNOLOGY

One of the rising nanotechnologies connected to renewable energy is nano leaves and stems of by artificial means created trees or plants. they're meant to harness energy provided by the wind and sun, thenceforth changing it into voltage what is more, to higher perceive the basic of nano leaves, we've to perforate associate degree innovative field of technologic development, known as Bio mimicry

The nano leaves have been specially designed to imitate the natural method of chemical change. A mechanism by that, typical plants absorb the sunshine emitted by the sun and greenhouse emission within the atmosphere. the bogus trees do even copy the natural re-cycling method O.

It is terribly recent that nano leaves technology began to reap even additional advanced levels. It will currently harvest thermal energy furthermore. Moreover, the leaves mounted on artificial trees also are ready to collect energy derived through movement of the wind, acknowledged as kinetic energy, that is furthermore born-again into electricity.

A. Composition of Nano leaves:

The nano-technology was initially developed to harness solely solar energy. However, nowadays it has widespread uses. It exploits various alternative sources of energy like wind, solar and thermal energy. Furthermore, these highly advanced artificial plants and/or trees use tiny cells to capture energy.

B. Construction of Nano leaves:

In order to construct the nano leaves we want solar battery, thermo voltaic cell, piezo voltaic cell and exposure galvanic cell. the development of nano leaves is extremely simple. during this initial of all we have a tendency to square measure making 2 clear conducting layers of oxide which can act because the outer body of the leaf. when this we have a tendency to square measure inserting one electric cell in between these 2 layers that is employed to convert the solar power into power then we have a tendency to square measure inserting the piezovoltaic cell, thermo galvanic cell and exposure galvanic cell. These all the cells square measure interconnected to the extremely conducted metal film to finish the circuit for the flow of electrons and protons. The electricity generator is placed on the lowest of the leaf that is employed to convert the strain attributable to rain and wind into the power. currently these leaves square measure connected to the twigs of the synthetic tree. Then these little twigs square measure connected to the stem of the tree with the suggests that of the crystal to covert the strain of the twig additionally into power. The power from the all leaves and twigs is keep at the lowest of the tree by mistreatment the storing device.

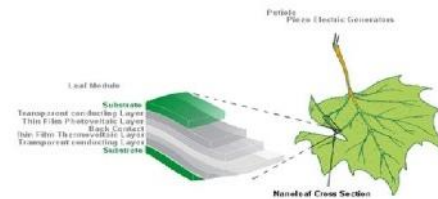


Fig. 2. Construction of Nano Leaf

IV. HOW IT WORKS:

Piezoelectric is a simple concept to generate electricity that comes from the pressure. We have used the exact meaning of the term, in order to create a sustainable energy resource by using light, heat and wind.

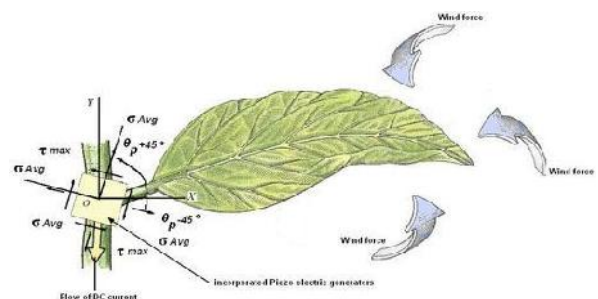


Fig. 3. Absorption of three natural effects in one leaf

When the force from the skin, just like the wind processing the leaves [with the degree alittle or a lot].Pd on the spot, mechanical stresses seem within the leaves, twigs, stems and

branches. This method will then generate scores of watts of Pico that with efficiency be regenerate into electricity. That way, the stronger the wind, the energy made are going to be a lot of and a lot of distinguished. throughout the day, nano leaves mirror the inexperienced lightweight in daylight and use photoelectrical nano spheres to convert the remainder of the visible lightweight into electricity. thermoelectricalnano wires /antennas convert heat from infrared, or thermal radiation, into electricity throughout the day, since the earth unceasingly absorbs thermal radiation so radiates it, even once dark. it's additionally distinguished within the analysis that with the correct material form and size, nano antennas might harvest up to ninety two of the energy at infrared wavelengths.[3]

V. BEST PLACES TO USE NANO LEAVES:

The use of piezo voltaic, thermo voltaic associate deegreed electrical phenomenon cells will effectively convert an consolidation of energy sources into electricity. Artificial energy trees is used for each domestic and even industrial functions. per analysis, erection associate degree approximate of six meter space of nano leaves will turn out enough energy for a mean menage. More, Byzantine is that, artificial trees is made at varied areas.

A. Desert:

The earth has large areas of unexploited deserts which can be used to generate a massive amount of electricity, if artificial trees were planted. The energy produced could be used to solve the most predominant challenge in desert; provide electricity to power desalination. The desalinated water could thereafter be used for irrigation and drinking purposes. The fragile desert environment would hardly be affected by such a project yet the benefits are extensive. To further minimize the environmental impact on desert, the artificial trees could be planted alongside roads, coasts and other areas where it would protect inhabitants from sandstorms and provide constant shade form the sun.[5]

B. Golf courses, Recreation ground and parks:

Artificial golf courses, recreational grounds and parks could have artificial plants and trees planted to supply electricity for at least a portion of recreational parks. For golf course, the nano leaves could fuel ground maintenance vehicles.

C. Office Parking and industrial zone:

The multi-fold benefits of planting trees near office parking and industrial zone are numerous. It provides with electricity to office, parking lights and other uses. Moreover, it does also provide with shade from the sun and offers an aesthetic landscaping.

D. Important trends of artificial nanoleaves trees in future:

- The electrical energy produced by these nano trees can be used to drive the cars.
- To enlighten the home.
- For business purpose.
- It can be used as the balancing factor between power prediction and environment.
- The main advantage is that it is used in efficient and green energy production which can restrict global warming.[4]

VI. ANALYSIS

A. Cost Analysis

As far as we concern about the cost of one nano leaf, it is around 105 paisa.

So if a tree is having 10,000 leaves then it can be constructed within Rs.15, 000 including stem and twigs. Thus for the renewable energy sources it is a very cheaper solution.

B. Production Analysis:

As we go for the production its one leaf can produce 1.20 V with a current of 100ma. So the total power produced by the one leaf Power = 1.20*100 =0.12W.

Table 2. Quantity Produced from the tree

S.No.	Quantity	Current	Voltage	Power
1.	One Leaf	100mA	1.25 V	0.125W
2.	One Tree			12500W

C. Analysis of Maximum Power Using Maximum Power Point Tracking System:

If there is an increase in power, the subsequent perturbation should be kept the same to reach the MPP and if there is a decrease in power, the perturbation should be reversed. The Perturbation is caused by changing the Duty Ratio of Buck Converter.

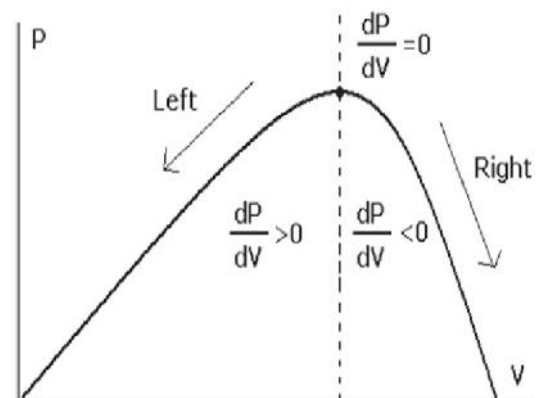


Fig 4. Graph of the maximum power production

Incrementing (decrementing) the voltage increases (decreases) the power when operating on the left of the MPP and decreases (increases) the power when on the right of the MPP. [7]

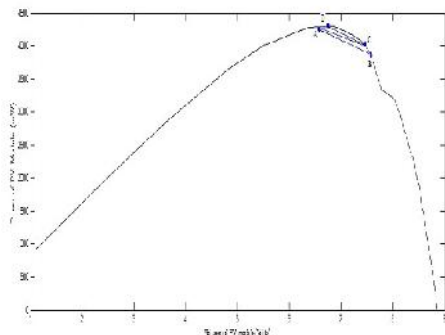


Fig. 5. Oscillations of power about MPP.

The above graph shows the Oscillations about MPP as well Drift during rapidly changing isolation & trade-off between dynamic response and precision of tracking.

VII. CONCLUSION

We perceive that energy potency is a lot of vital than ever. we have a tendency to additionally believe that the visual character of the landscape greatly influences America and leaves an enduring impression on however we have a tendency to feel. that is why we provide the distinctive properties of our Triple economical nanoleaves Trees. we've got developed the primary multifunctional renewable energy systems that actively converts lightweight, Heat and Wind into useable electricity, day and night, and that we area unit unendingly trying for ways that to build them as economical as potential, from the materials we have a tendency to use for our Nano leaves like nano- electrical phenomenon (to convert the actinic radiation into electricity), Thermo voltaic (to convert thermal variations into electricity) and Piezo voltaic (to convert mechanical movement into electricity) up to our sturdy tree structures, we have it coated once it involves energy potency. As an entire we {will|we are able to} say that these artificial trees not solely can build the globe stable within the field of energy however additionally will cut back the utilization of fuel that is that the main cause for the world's largest downside 'Global Warming'.

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